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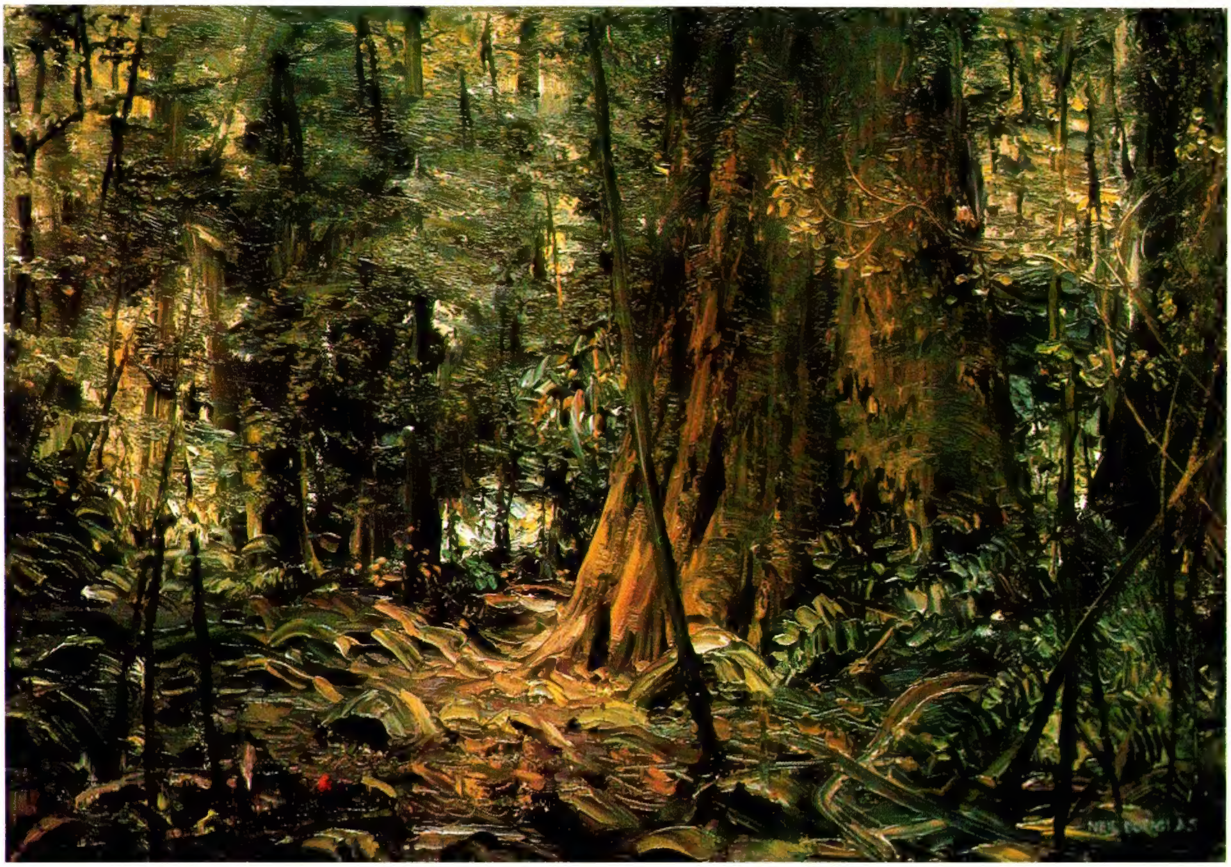
EARTH GARDEN



Trees

The theme is trees — about saving them and how to plant more trees to regenerate our depleted bush. Plant a tree for us!

• TRIBUTE TO TREES • ST BARBE BAKER • TREE TALES • HOW A TREE WORKS • GROWING NATIVES FROM SEED • REFORESTATION • COPPICING • DIEBACK • TALL TREES • NEIL DOUGLAS — AN ARTIST IN THE BUSH • TREES IN FARM PLANNING • THE WOODCHIPPER BLADE • FORESTRY DIRECTORY • EARTH BUILDING BOOKS & ADVICE • COB FORMWORK • LOW COST COUNTRY HOMES • A LOG HOUSE (PART 2) • ACCESS • LAND LINES • LOTS MORE

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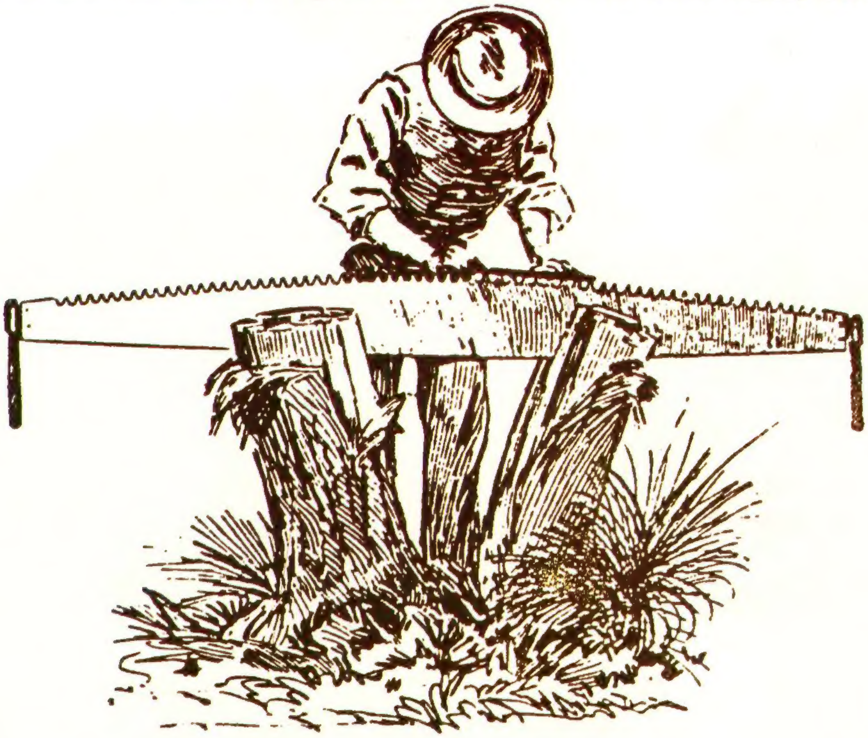
*Recommended and maximum price only.

THE SETTLER'S GUIDE

A biased selection from *The Agricultural Gazette of New South Wales*, 1890-1910.



Tried and true advice for Australians

Leafing through dusty volumes of early issues of *The Agricultural Gazette of NSW* one day in the library, I was struck by the wealth and range of practical advice then available for farmers and settlers.

Page after page contained simple, illustrated stories on jobs like clearing timber with a block-and tackle, cutting out a square gatepost from a log with adze and axe, using a scythe, harnessing a plough horse and choosing tools like axes, saws, hammers and chisels and how to oil and sharpen them.

"You just can't get this kind of information anymore," I thought, regretting that all this bush lore and old-time skills were being lost. It was just *so good* and I saw immediately how useful it would be to new settlers starting a more self-reliant life in the bush today.

The Settler's Guide is the final result of these thoughts and quite a few more visits to the State Library of NSW in Macquarie Street, Sydney. In the end I read, or at least scanned, some 23,800 pages before making this careful selection. It was my task to pick the eyes out of this vast source material for the "how-to" stories, from twisting barbed wire with a forked stick to the original recipe for the whitewash used at the White House in Washington. It wasn't an easy job, either. First I deliberately chose the period from 1890-1910 because it falls before the widespread use of artificial fertilisers and tractor-drawn machines on the farm.

Next I applied my own biases towards small scale, mixed farming, clear explanations and the basics of providing food and shelter "off the ground" in the Australian bush. The nostalgia for the times has been tempered by the need for plain advice which is just as relevant in the 1980s as it was at the turn of the century.

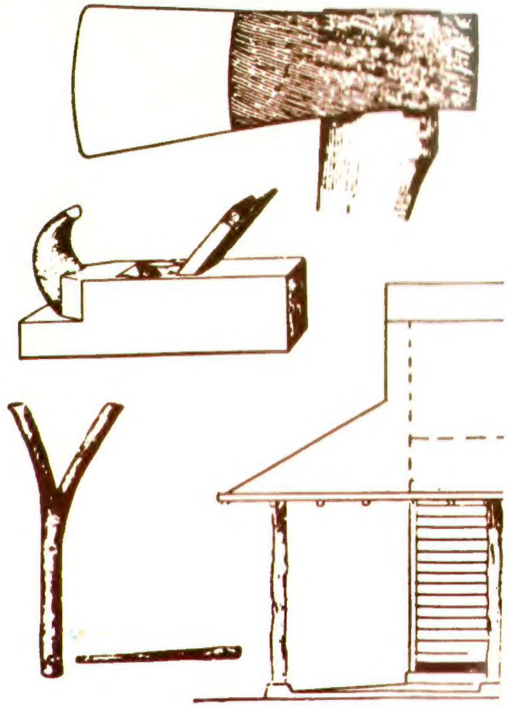
The information has been arranged so that it will outline from "go" to "whoa" how to set up a farm, build fences, a dairy, start an orchard, grow vegetables and keep horses, cows and poultry. Detailed descriptions are given on such tropics as building a slab timber hut and a pise house, making a windmill and concrete fence posts and dwellings.

It's a quality paperback, square-bound, printed on fine paper and well-designed, using the original drawings and photographs from the ***Gazette***.

Keith

The Settler's Guide

Compiled by Keith Smith, Nelson, Melbourne, 1981, large format paperback, 176 pages. Price $13.95 posted (see order form page 58).



Earth Garden, established in 1972, presents a range of natural lifestyles. It is intended as a key to sources, practical ideas, alternatives and self-sufficiency.

It is concerned with non-polluted living and growing, the back-to-the-earth movement, surviving in the city, the bush, food and diet, and the inner changes which follow when you are in tune with nature.

Let us lead you up Earth Garden's path to the good life.

We don't have advertisements in Earth Garden. That way we're not influenced by any vested interests. Books, places and products recommended are those we think relevant.

Edited and published by Irene and Keith Vincent Smith

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EARTH GARDEN 32

The Cover

Front: The base of a mountain ash *(Eucalyptus regnans)* near Mt Donna Buang, Victoria, caught in a shaft of sunlight by artist Neil Douglas.

Back: Neil Douglas (top) and his environment, the mudbrick home in the bush at Kangaroo Ground, Victoria (below) with (at right) some of the manna or ribbon gums *(E.viminalis)* in the young forest.

Trees

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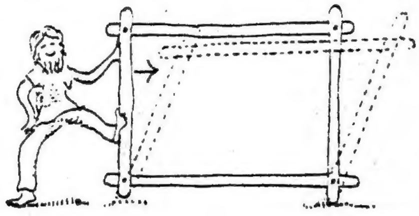

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*Land Lines is a free service for **Earth Garden** readers, who must give their full name and address as proof of their sincerity. They also have the responsibility to thoroughly check all deals.*

Please keep listings to 50 words, plus name and address.

I'm looking for 1-25 acres to buy within 100 miles of Melbourne. I'd like bushland, perhaps with some cleared. Land near or adjoining State Forest or with running water would be preferred. I can pay up to $16,000.

If anyone can help, could they please contact: Sue Miller, 10 Aanensen Court, Montmorency, Victoria, 3094. Phone: (03) 439 9885.

At present I live in south-west Queensland, but would like to move right up to the Tropics. Could new settlers write and advise me of the "alternative" situation up there? Any information would be good, on land buys, water, climate, soil, good areas to be in and what people are doing.

Dave Griffiths, Mukushla Farm, PO Brooweena, Qld 4620.

land lines

We have a small farm near the Grampians with ponies, goats, poultry and a large garden. Our children are aged 9 and 7 years and we are looking to meet some Earth Garden type people who would like some work experience, or just a weekend visit. Conditions are a bit primitive but the atmosphere is great.

Call or write: Bob & Sue Bender, RMB 2220, Horsham, Victoria, 3400. Phone: (053) 84 3222.

Are there any Earth Garden readers in need of two young, energetic men (aged 18-20)? We are both non-smokers and vegetarian. We love nature and would love to hear from anyone around the Toowoomba-Brisbane area who has a comfy, cosy cottage on a few acres, either to rent and/or caretake the property. We have some experience in gardens, painting and general caretaking. We're not afraid of a bit of hard work and would be grateful if anyone could assist us, soon.

Yours sincerely, Earth Garden Brothers, Glen & Curt Edwards, 517 Scenic Drive, McMasters Beach, NSW, 2250.

Girl, 29 years, trained in horticulture, seeks work in organic gardening.

Write to Rosemary Beaumont, 63 Pyrland Road, London N5 2JA, England.

We need a bit of help for a few weeks at World's End. Some gardening, some fencing, some horse work, some building, etc — the only stipulation being that we get along together and you're not afraid of horses. Can offer food and accommodation, plus training in bush skills in exchange.

Kaye & Keith Watson, World's End, Mudgee, NSW, 2850. Phone: (063) 73 0388.

We want to rent our place out for the next couple of years from early January 1982. It's 40 acres tucked away in the hills behind Coffs Harbour, NSW. About four acres is cleared with heaps of young fruit trees, some starting to bear. Also, five dams, vegie garden, furnished timber dwelling 36' x 20' with fireplace, wood stove (unlimited firewood), rainwater tank and telephone. No electricity (we've been comfortable without it) though it's wired for a generator if you have one. Ideal for caring, responsible people who appreciate trees, birds, peace and blissful privacy. Rent will be $45 week.

Richard and Margaret Waterman, PO Box 966, Coffs Harbour, NSW 2450. Phone (066) 54 4254.

New migrant from the Netherlands, eager to settle down in Tasmania with his wife and two small boys (aged 4 and 3) requires work. Although qualified forester (educated in preservation and maintenance of the forests) with a sound agricultural experience. I'm willing to try anything. Both my wife and I are fond of nursing indoor plants and growing flowers and would love to make a living out of this. In the near future we will have a small capital (about $8,000) at our disposal.

Who can help to give us a start? Hank Ottow, 15 Durkins Road, Quoiba, Tasmania 7310.

I am trying to buy an old Bedford bus, unregistered in re-sitable condition and going order. I am willing to pay by monthly instalment. The bus must be able to be driven and cheap (under $400) and with no rust. I am going to make it a sort of camper bus.

Write to Rodney Jean Homee, RSD Yorkshire Road, Marong, Victoria, 3515.

A family of four (ages 32, 30, 5 and 2), with some money, would like to settle in the far south-east of NSW or the far-east of Victoria. We would be pleased to hear from any co-operatives or tennants-in-common who would like new members or visitors. We have a camper trailer and can go anywhere in this area after Christmas. We are also interested to hear from people who want to form a co-operative there.

Sandra Clayton, Falls Road, Fish Creek, Victoria, 3959.

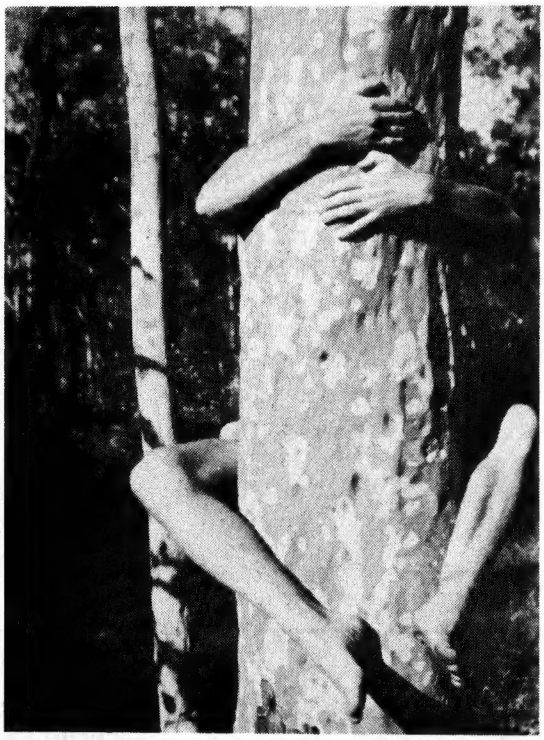
Wanted: 10-20 acres freehold with permanent water, dam or creek — must be able to view without obligation. North of Nambour and boundary fences preferred. Need not have buildings or power, only gentle slopes desired. However, we are willing to consider anything, anywhere. Limited finance.

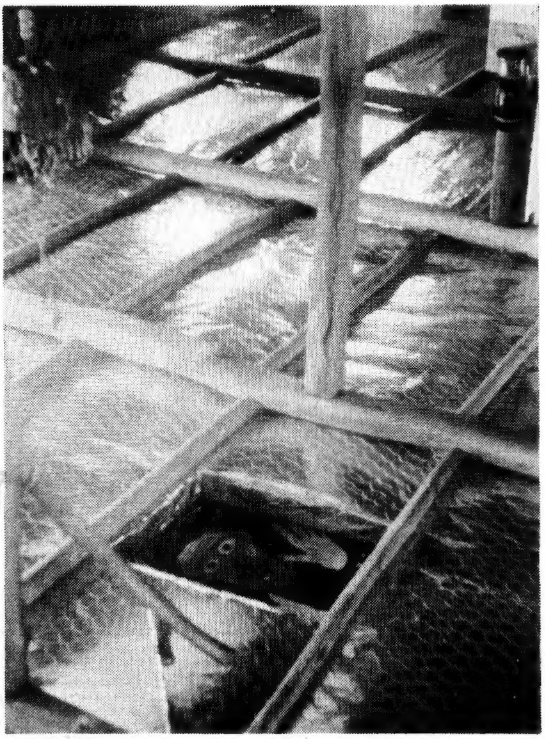
Sincerely, Eileen & Bill Souter, C/- 64 Chandos Street, Wynnum West, Qld, 4178.

I am a Kiwi, but have been in Australia for about three years and have now decided that I would like to settle here if I could find the right place for the right price. The Nimbin-Kyogle area of northern NSW seems to have an awareness of lifestyle similar to what I am after, also southern Queensland. I would like to hear from anyone who could fill me in on these areas: the hassles, climate, potential, land prices (not real estate rip-offs), building codes and general happenings.

I am about to start a herbal therapy course and would be growing as many herbs as possible on the land. My lady is into weaving and painting.

Yours sincerely, Rob Blair, 71 Brickwharf Road, Woy Woy, NSW 2256.





a tribute to trees

By Peter van Haeff

This is a dedication, a tribute to trees.

Because our land was covered in trees and was bushland rather than "improved pasture" we were able to buy it relatively cheaply.

Nature called us back to the land, to live by the sweat of the brow, to build a roof over our heads and till the soil to feed ourselves.

We built our home from timber off the property, in the form of round bush poles and sawn hardwood slabs which were used for the external cladding. We cut the slabs with the help of a neighbour and his *Argon* saw and tractor and saw-bench.

So our trees have provided us with shelter. Fallen trees also provide firewood to keep us warm in winter through a pot belly stove, our food is cooked on a wood stove and we have a chip (cheap) heater to provide hot water for the bath.

Fences were constructed with split hardwood posts to separate the animals from the food gardens.

About 10 acres are being used for agriculture: to grow vegetables, grains, fruit, nuts, herbs and flowers. We have poultry for meat and eggs and a cow to provide us with dairy products (she shares her paddock with the local kangaroos and wallabies).

Cow and poultry manure are important for building up the fertility of the gardens. Three beehives provide us with all the honey we require (and more). They are also important for pollination of fruit trees.

The remaining 112 acres of land will remain as bush, catering for such diverse uses as timber supply (building, fencing, firewood), water catchment, honey production, providing oxygen, stabilising the soil, for their impact on climate and their scientific and education value, providing food and shelter for our unique fauna and flora and giving us the opportunity to commune with nature for solitude and inspiration.

Instead of calling on some person, we can pay a visit to a particular tree; the blueberry ash *(Elaeocarpus reticulatus),* with flowers like tiny ballerinas dancing on the breeze; red peppermints with trunks up to 10ft in diameter; the painted patterns of the feminine, smooth bark of spotted gums *(E. maculata),* accentuated by the charred and blackened trunks of ironbarks *(E. paniculata);* or the shapely nakedness of a blue gum *(E. deanei)* standing like a pagoda in the middle of the bush. These are the shrines I like to visit.

I have a real need to go into the bush, touch the trees, smell the flowers, make a bed of the leaves, look at the sky through the wind-ruffled intricacy of leaves and birds and bathe in a mountain stream where the reflections of trees and clouds dance on the surface. The only sounds there are the whispering of leaves, the mumbling of moss and nature's chorus of birds and frogs.

And yet, there are still people who look on the bush as useless and monotonous scrub, to be put under the blade of a bulldozer.

In just 200 years we have already destroyed more than half of Australia's original forests.

We cannot live happily and healthily without trees.

FATHER OF THE TREES

It's almost 60 years since Dr Richard St Barbe Baker was given the title of *Baba wa Miti,* or Father of the Trees, by members of the Kikuyu tribe in Kenya.

As a professional forester and Assistant Conservator of Forests at the time, he had initiated tree planting ceremonies and a tribal "Dance of the Trees" which led to the formation of the first *Men of the Trees* group in 1922.

It wasn't long before the Kenyans had planted one million trees. Countless millions of trees have been planted for reforestation all around the world since then because of the persistence and driving force of this remarkable man.

Today, at the age of 92, Dr St Barbe Baker continues to travel widely, giving talks and interviews on radio and television in his tireless campaign to save our dwindling forests from destruction.

A vegetarian and a member of the Baha'i faith, he has been devoted to trees and forests since he was a child in Hampshire, Britain. He has written some 25 books about trees, including *Men of the Trees* (1931), *The Redwoods* (1939), *I Planted Trees* (1944) and *My Life — My Trees* (1970).

During the 1930s Richard St Barbe Baker helped to save the ancient, giant Californian Redwoods *(Sequoia* species) from logging, in part by enlisting the aid of the Rockefellers and Presidents Hoover and Roosevelt.

He has a vision of reclaiming the Sahara Desert by encircling it with a green belt of trees. This was the stimulus which led New Zealander Wendy Campbell-Purdie to North Africa where she has planted her own oasis of 130,000 trees at Bou Saada in Algeria which has succeeded in checking the encroaching sands.

Dr St Barbe Baker now lives at Tekapo, near Mt Cook in New Zealand and twice visited Australia in 1981 for talks on behalf of Men of the Trees. We have drawn on quotations from his books and interviews to give this view of his deep interest and knowledge of trees and their true value.

Its (the tree's) organism is akin to our own in many respects. It has for blood, its sap. It has a circulatory system. It has for skin, bark. It has for lungs, its leaves. Like ourselves, it must have food, and the tree draws its nourishment from the soil and air and sunlight.

The tree adapts itself to circumstances. Sir Jagadis Bose, as also the Austrian forestry research students, have proved that the tree has heart-beats and that the pulsatory reactions of a plant are exactly parallel to those of a human being or animal. It responds to stimulants and can be put to sleep under an anaesthetic. Its growth can be arrested or stimulated by electricity and it can feel an electric shock.

. . . These are not myths, but proven scientific facts of vital interest to mankind, which must be realised so that man may once again attune himself to the spirit of trees. These unknown neighbours of his have much to give if man will meet them halfway.

I Planted Trees, Lutterworth Press, London, 1944.

* * *

We stand in awe and wonder at the beauty of a single tree. Tall and graceful it stands, yet robust and sinewy with spreading arms decked with foliage that changes through the seasons, hour by hour, moment by moment as shadows pass or sunshine dapples the leaves. How much more deeply are we moved as we begin to appreciate the combined operations of the assembly of trees we call a forest.

As long as the soil is covered with forest its humus is maintained. The basic forest problem lies in its composition and regeneration. In the forest the processes of decay and growth always balance one another. The vegetable wastes together with the by-products of the animal population form a mixture on the forest floor. As we examine this mixture from time to time we find it remains practically constant in depth, in spite of annual additions from leaf-fall that takes place. This mixture is drawn upon at an even rate by earthworms, fungi and bacteria, and the resulting humus in turn is absorbed by the soil and provides the trees and undergrowth with the food materials they require. Thus the forest manures itself and with the help of the earthworms and other animals distributes this manure through the upper layers of the soil.

* * *

I look at it like this: if a man loses one-third of his skin he dies; the plastic surgeons say, "He's had it." If a tree loses one-third of its bark it dies. This has been proved scientifically by botanists and dendrologists. Would it not be reasonable to suggest that if the earth loses more than a third of its green mantle and tree cover, it will assuredly die? The water table will sink beyond recall and life will become impossible.

* * *

I picture village communities of the future living in valleys protected by sheltering trees on the high ground. They will have fruit and nut orchards and live free from disease and enjoy leisure, liberty and justice for all, living with a sense of their one-ness with the earth and with all living things.

My life — My trees, Lutterworth Press, London, 1970, 180 pages.

* * *

In Australia it is of the utmost importance to restore tree cover and protect what existing natural forests remain, especially the tropical evergreen forests which are the main supply of the oxygen. In my opinion, there should be no clear-felling at all. When the earth becomes exposed to the light and sun, it becomes feverish, and the water table sinks and may go beyond recall.

As part of Australia's reforestation programme, I would think every natural forest reserve with belts of natural forest trees, so that the denizens of the forest might be allowed to move from one part of the country to another, in their seasonal migrations. Where possible, natural regeneration should be encouraged and planting should only be resorted to when that has failed, or in new projects.

Keynote address to the Northern Rivers Reforestation Seminar, September, 1980.

* * *

The most important product of an indigenous forest is air — oxygen. We live less than five minutes without air, so I regard oxygen as the primary product of a forest. Next to that comes water. Trees are absolutely essential in the water cycle. We live less than five days without water, so I would put that as number two. And number three is food. We live less than five weeks without food, and trees are absolutely essential for the production of food, the biological contribution that trees make in creating a climate. The fourth product of the forest could be to prevent acceleration of erosion. The fifth could be temperature. . . The sixth thing could be the balance of nature and all the flora and fauna in the forest, which is very fragile, and if you upset the balance of the natural forest you upset all those things; and the next thing could be timber — lumber — so it's way down the list.

* * *

You must remember that the trees worked for millions of years, making it possible for man to arrive on this planet. But man, who owes his existence to trees, has been cutting and burning greedily and recklessly; he's turned the forest into a desert, and we are now being faced with not only a famine in food but a famine in timber.

Science Show interview with Barrie Oldfield, ABC Radio, 1981.

Men of the Trees

The organisation founded by Dr Richard St Barbe Baker for the planting and protection of trees has branches throughout the world and is growing strongly in Australia. Please send SAE when enquiring.

NSW, Secretary, Mrs Pat Steed, 29 Darwin Street, Carlingford, NSW 2118.

Victoria, Secretary, Mrs M. Down, 4B Yarrabat Avenue, Balwyn, Victoria 3103.

Queensland, The Secretary, PO Box 283, Clayton, Qld 4011.

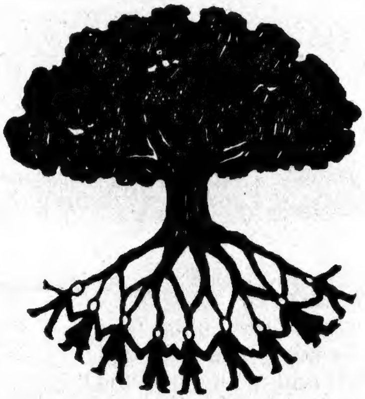
Western Australia, President, Charles Peaty, 1179 Hay Street, West Perth, WA 6005.

Britain, Crawley Downs, Crawley, Sussex, England, Magazine *Trees*, twice yearly.

I have the dream of the whole earth made green again, an earth healed and made whole through the efforts of children; children of all nations planting trees to express their special understanding of the earth as their home, children of all races holding hands circling the earth and expressing and celebrating their special understanding of all children as their brothers and sisters.

RICHARD ST BARBE BAKER, Grove of Understanding, Golden Jubilee, Redwoods, California, April 20, 1980.

Children of the Green Earth



By Peggy Johnstone

How to join this wonderful organisation? There are no fees, but children should be aged between nine and 12 years old.

Here in Queensland, we have allowed any child up to 12 years of age to join and many of our group are younger than nine. At 12 years, the child is old enough to join *Men of the Trees,* the adult movement founded by Richard St Barbe Baker.

To be eligible to be able to write to other *Children of the Green Earth,* both in Australia and overseas, each child should have planted a tree and taken care of it when possible. There does not need to be an organised group — any child who cares for our beautiful earth may consider himself or herself a member.

A few suggestions on what to do:

- Plant a tree, or even a shrub, pot plant or dandelion, take care of it, talk to it and, most of all, love it.
- Get together a group to start a tree planting project. Our group planted seeds of native trees, then transplanted them to pots and then, when they were mature enough, planted some at our meeting place. Each child took one home. Take care in selecting a suitable tree for the area to be planted.
- We have found schools very keen to start groups. An interesting story tells the worth of this. A Brisbane headmaster of a school in a depressed area, with the help of a keen local, set up a project some years ago to germinate and grow native trees. The children ran it themselves with help and advice when they asked for it. They did all their own experiments, including the discovery that they could germinate some native seeds by heating them over a bunsen burner. They kept photographic and written records describing their progress.

Before they became so involved in the experiments many of the children had been illiterate and were disrupting influences in the school, but they taught themselves to read and write so that they could keep records of the experiments. They gained a new image of themselves as able, intelligent people and, as a result, became more responsible and useful students.

- Earthworm "farms" are a very useful suitable hobby for schools. They are great for raising funds too!
- Write to other Children of the Green Earth. Groups are being established all over the world.

In working with children, it is worth taking some notes from St Barbe. He always gives an inspiring talk to the children at their own level, impressing on them the great importance of trees and the earth in the future. One child is chosen to be "in charge" of each tree. Everybody wants this prestigious job, so much enthusiasm is engendered.

The children do the planting themselves, adding compose and earthworms to the soil and placing a large flat stone (about 6ins x 4ins) near the base of the tree. The stone provides safety and moisture for the worms and they take the moisture back down to the roots of the tree. Solemn instruction is given on the importance of talking to the trees. The children love it and become very involved with their trees.

Remember, that if you talk to, care for and love all that is nature, it will return your gift immeasurably, for you are creating the soil through which all the energies of the universe can flow to create a beautiful new world.

Children of the Green Earth

World headquarters: Secretary, Box 3, Lake Tekapo, New Zealand.

Queensland: Peggy Johnstone, Box 12, Moorooka, Qld, 4105.

Please send SAE when enquiring.

TREE TALES

The tree touch

We have had extraordinary success with trees that Richard St Barbe Baker has helped to plant — almost 100% success — against great odds and previous bad records. In one area trees, newly planted, disappear overnight, but in an open park of 100 trees, not one is missing. It can only be the love given to these trees which cares for them so well.

St Barbe himself has an amazing effect on trees. An old orange tree in our yard which had not borne fruit for at least three years suddenly produced a crop of sweet, juicy oranges after he had been a guest in our home.

Peggy Johnstone of Children of the Green Earth, Queensland.

Trees for Richard

Recently when our little son, Richard, died at 3½ weeks of age, Rosemary and I had to face a further cultural tradition with regard to his funeral. We wanted all about us to feel joy that he had been born rather than sadness at his death.

We wanted the cremation to be a happy and uplifting experience and an opportunity for people to break through their conditioned reactions to such an event. It is all too easy to reflect negativity and sadness instead of positivity and love. I understand that the idea of flowers at funerals originally was not for the deceased but as a bright stimulation for the next of kin. I believe strongly that instead of wreaths of flowers we should help all to be wreathed in smiles.

In the funeral notice we asked all who would normally send flowers to plant a tree for Richard in love and joy. This has been fantastically successful. Some people brought beautiful little trees to the funeral and gave them to us to plant on our acres at home. Others have visited us tree in hand and popped them in the soil. We have received letters from all over the world saying that the writers had planted a tree in their country for Richard. I have heard of little groves being established and various people saying it had inspired them to start planting trees. From Darwin we heard of "Richard Raintree" going into a garden there. In several other cases a number of people collectively sent money for the purchase of certain types of trees.

At a time when more and more people are becoming tree conscious and at a time when there is increasing awareness of the value of trees to our very existence let's stimulate life, love and all the good things that trees give us. How good it will be to know that when I die the world will be beautified by many more trees. If the idea can be promoted just think of the vast numbers of our tree friends that will take up position whenever a leading member of our society dies. Please spread the word and let this idea flow all over our planet which is crying out for more trees. At the same time could there be a more appropriate memorial than a tree which grows in magnificence every day?

Lionel Fifield is co-ordinator of the Relaxation Centre, Cnr Brooks & Wickham Sts, Fortitude Valley (Brisbane), Qld.

The Oak Beams of New College, Oxford

This classic tree tale was told to anthropologist Gregory Bateson who told it to Stewart Brand, who retold it in the *Next Whole Earth Catalog* (review EG30). We retell it briefly.

It was noticed that the big oak beams of New College, Oxford in the dining hall of New College, Oxford were full of beetles. The College Council were dismayed. Where would they get beams of that calibre nowadays? A Junior Fellow suggested sending for the College Forester to ask him if there were any oaks on College grounds.

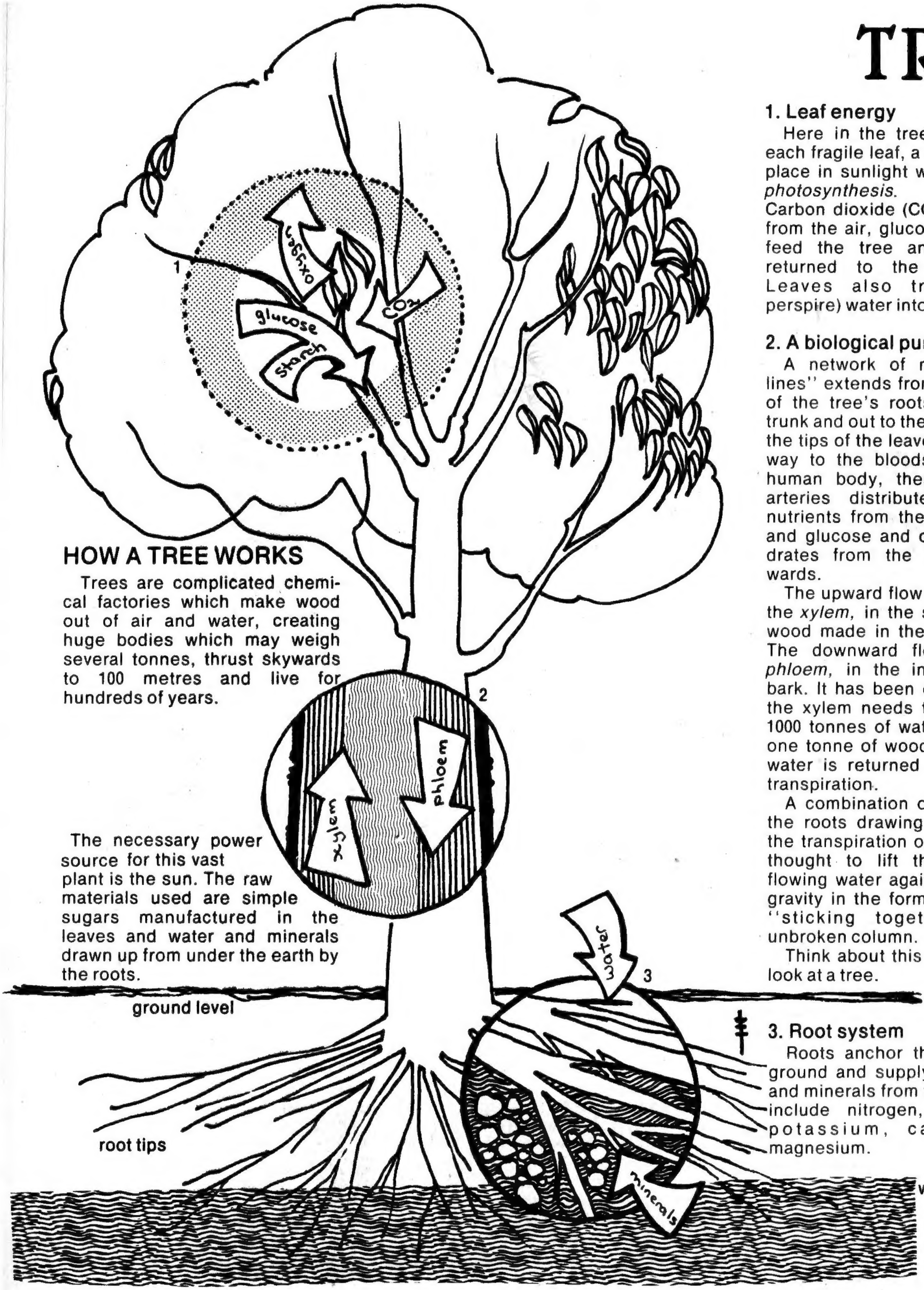
He tugged at his forelock and said, "Well, sirs, we was wonderin' when you'd be askin'!" So, it was discovered that a grove of oaks had been planted when the College was founded (in the late 16th century) to replace the dining hall beams when they became beetly. The plan had been passed down from one Forester to another for 400 years — "You don't cut them oaks. Them's for the College Hall."

Some trees I know

The old bush lemon, still bearing unblemished, disease-free fruit in a dry creek-bed in the middle of a forest, completely overgrown by a bush vine... An ancient China Pear, split to the ground by lightning, sending out beautiful blossoms, loads of fruit and new, tender shoots... A mango tree, planted by a young boy 30 years ago in a burnt-out tree stump in an area normally too cold for mangoes, yet bearing lovely, sweet fruit in a kindly season ... a beautiful white cedar, stricken by disease, bravely putting forth light green lacy leaves each spring as it slowly dies — offering its branches to birds who quarrel over the worms and bugs in the vegetable garden below... The stark skeletons of bygone forest giants, towering above darkly forested hills, majestic silhouettes against an incandescent twilight sky.

Pauline Williams, Mt Nardi, via Nimbin, NSW.

TREE



HOW A TREE WORKS

Trees are complicated chemical factories which make wood out of air and water, creating huge bodies which may weigh several tonnes, thrust skywards to 100 metres and live for hundreds of years.

The necessary power source for this vast plant is the sun. The raw materials used are simple sugars manufactured in the leaves and water and minerals drawn up from under the earth by the roots.

1. Leaf energy

Here in the tree's foliage, in each fragile leaf, a process takes place in sunlight which is called *photosynthesis*.
Carbon dioxide (CO_2) is taken in from the air, glucose is made to feed the tree and oxygen is returned to the atmosphere. Leaves also transpire (or perspire) water into the air.

2. A biological pump

A network of natural "pipelines" extends from the fine tips of the tree's roots, through its trunk and out to the branches and the tips of the leaves. In a similar way to the bloodstream of the human body, these veins and arteries distribute water and nutrients from the soil upwards and glucose and other carbohydrates from the leaves downwards.

The upward flow takes place in the *xylem*, in the sapwood, new wood made in the current year. The downward flow is in the *phloem*, in the inner layers of bark. It has been estimated that the xylem needs to carry about 1000 tonnes of water to produce one tonne of wood. Most of this water is returned to the air by transpiration.

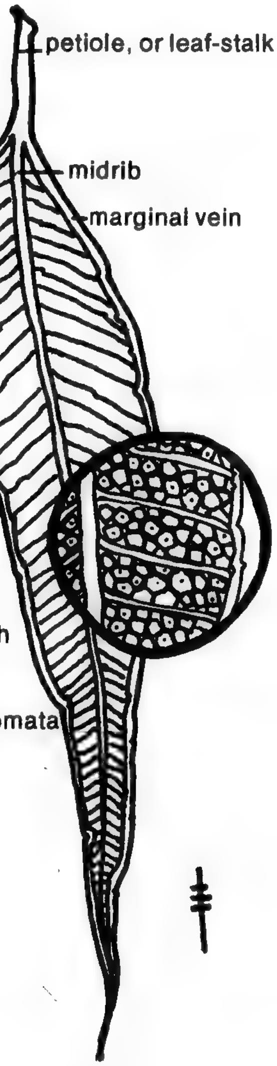
A combination of the force of the roots drawing in water and the transpiration of the leaves is thought to lift the continually flowing water against the pull of gravity in the form of molecules "sticking together" in an unbroken column.

Think about this next time you look at a tree.

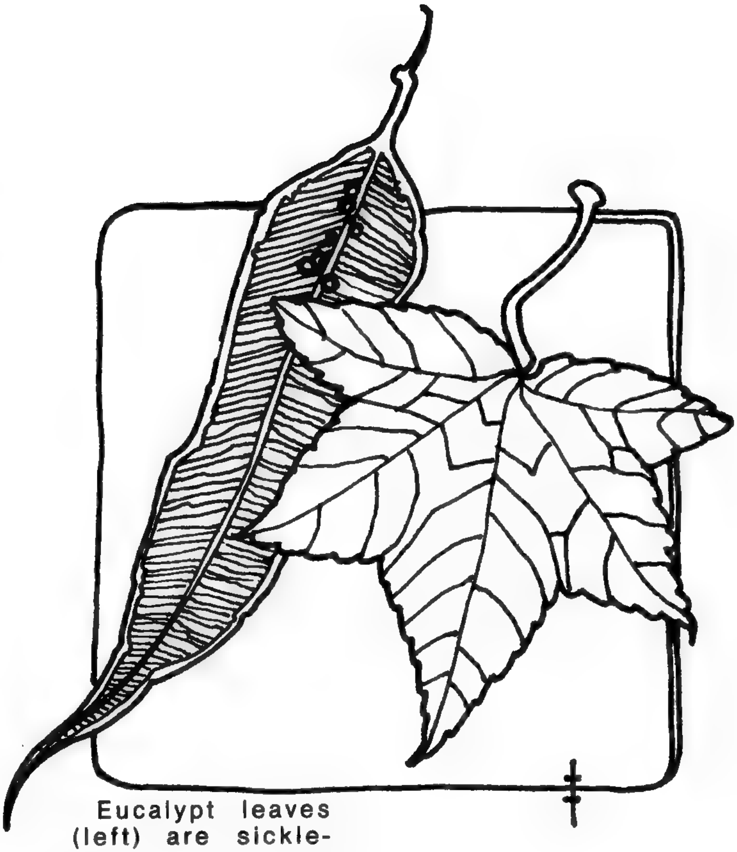
3. Root system

Roots anchor the tree in the ground and supply it with water and minerals from the soil. These include nitrogen, phosphorus, potassium, calcium and magnesium.

& LEAF



A leaf, with magnified section showing stomata



The flat, paper-thin blade of a leaf is made up of layers of tissue which may amount to 50 million cells. It is criss-crossed by small veins which supply the leaf with water containing mineral salts. Veins run in two directions in the leaf, in separate tubes or pipes. The *xylem* tubes take water up the leaf while the *phloem* tubes take glucose from the leaf to feed the tree and roots.

Most eucalyptus leaves hang straight down with their edges to the sunlight. They absorb light on both sides of the leaf, so eucalyptus leaves have two layers of long cells full of chlorophyll inside the skin.

These are called photosynthetic palisade cells. All the work of converting carbon dioxide to starch and glucose which the plant needs to build itself goes on in these cells.

Eucalypt leaves (left) are sickle-shaped in many species and hang vertically, to reduce water loss during hot, dry weather. Leaves of deciduous trees from the Northern Hemisphere (right) have a distinct upper and lower surface and are usually flat and broad, seeking the sun by spreading out horizontally.

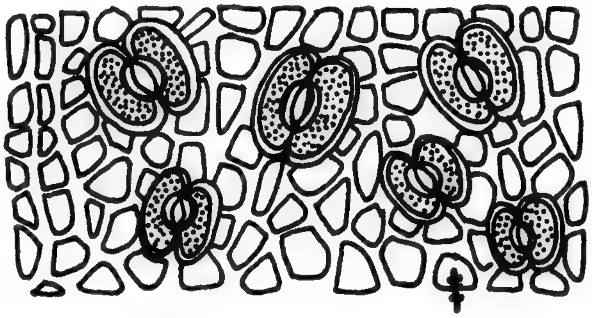
Eucalypts are evergreen, producing new leaves and shedding old leaves at any time of the year. Deciduous trees drop their dead leaves each year in the autumn (or "fall").

Stomata

The surface of every leaf contains thousands of tiny pores called *stomata* (singular *stoma*), openings which look like tiny mouths when magnified. These cover both sides of a eucalyptus leaf. There are about 22,000 stomata on every square inch on either side of the leaf of a bluegum *(E.deanei)*.

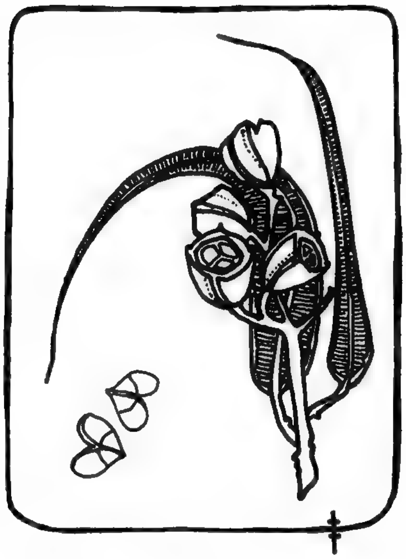
In deciduous Northern Hemisphere trees, the leaves spread out horizontally and receive the sun's rays on the upper surface. These have all, or most, stomata on the underside of the leaf.

Stomata are constructed in such a way that the pores open wide to "breathe" in moist conditions, evaporating invisible water, but close in dry weather when the tree needs all its moisture. Air enters into the tissue of the leaf through these stomata.



Leaf magnified to show stomata

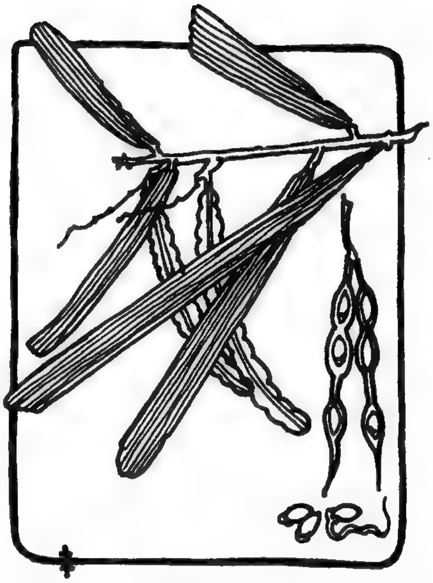
Native trees from seed



Eucalypt seeds (here shown greatly enlarged) are contained inside capsules, or gumnuts.

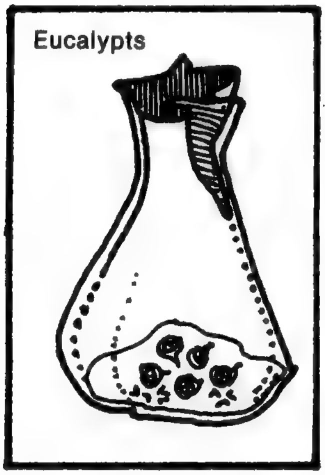
Most native trees, including eucalypts and wattles *(Acacias)*, may be successfully propagated from seed collected directly from growing trees or bought from a seed supplier. These are the basic guidelines to follow.

Choose local varieties, making sure that the parent tree is healthy and well shaped. Gather older, fully-developed eucalypt capsules before they open either from the tree, or from fallen twigs on the ground after winds or heat. Wattle seeds are often found on the ground around the tree (if the birds don't get there first). The best time to collect the seeds is in early summer. They are ripe when brown.



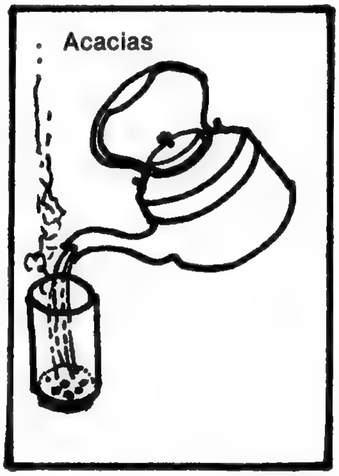
Wattle *(Acacia)* seeds usually burst from their seed pods when ripe.

Eucalypts



Place eucalyptus capsules in a paper bag or envelope. They will dry out and release the seeds if kept in a warm, dry place, such as a sunny windowsill. Keep the seeds for a few weeks more before planting to make sure they have ripened properly. There should be many tiny seeds, as well as non-fertile "chaff" in the packet. Eucalyptus seeds may be stored for fairly long periods sealed in paper bags or screw-top jars in a cool place. Red box *(E.polyanthemos)* seeds have been germinated after 11 years' storage.

Acacias



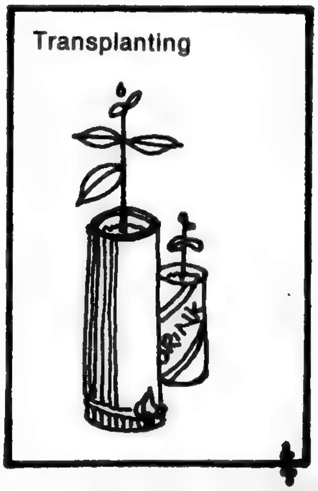
The shiny, black, hard-coated wattle seeds need special treatment to germinate. The usual method is to pour boiling water over the seeds in a cup and soak them overnight (or *boil* the seeds for one minute only). Remove the seeds which swell for planting and treat the others again.

The seeds may also be *scarified* to help germination — rub them between sheets of coarse sandpaper, or file, scratch or nick them with a knife or razor blade to thin the hard coat.

Sowing

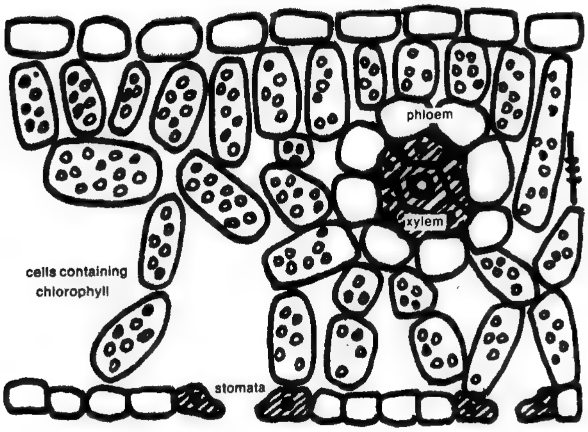
Sow wattle seed straight after treatment and eucalypt seed as needed. Use wooden or plastic punnets, boxes or trays with drain holes, or paper or peat pots. Two inches of compost covered with a sprinkle of sand makes a good potting mix. Sow thinly and evenly, then press down the surface with a flat board. Keep moist by watering with a fine spray, never allowing the soil to dry out. A pane of glass over the boxes provides extra warmth and moisture. Acacias germinate in 2-7 days and eucalypts in 3-4 weeks. Shade with hessian

Transplanting



Prick out the seedlings singly when they are 3-5cm high and the second pair of leaves have formed. Transfer to individual containers, such as bamboo, metal or plastic tubes, tins or cardboard containers filled with compost. Water immediately. Acacias may be planted in twos and threes in permanent position at this stage. Shade plants at first, then "harden off", by gradually increasing their exposure to the sun and reducing the amount of water they are given.

THE MIRACLE OF A LEAF



Section of leaf magnified

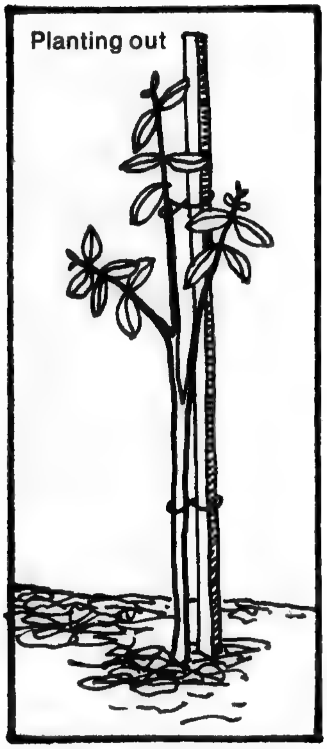
Photosynthesis

Inside each leaf and in the myriad of beautiful leaves which make up the foliage of a tree, the process of *photosynthesis* (Greek: "putting together with light") goes on as long as the sun is shining.

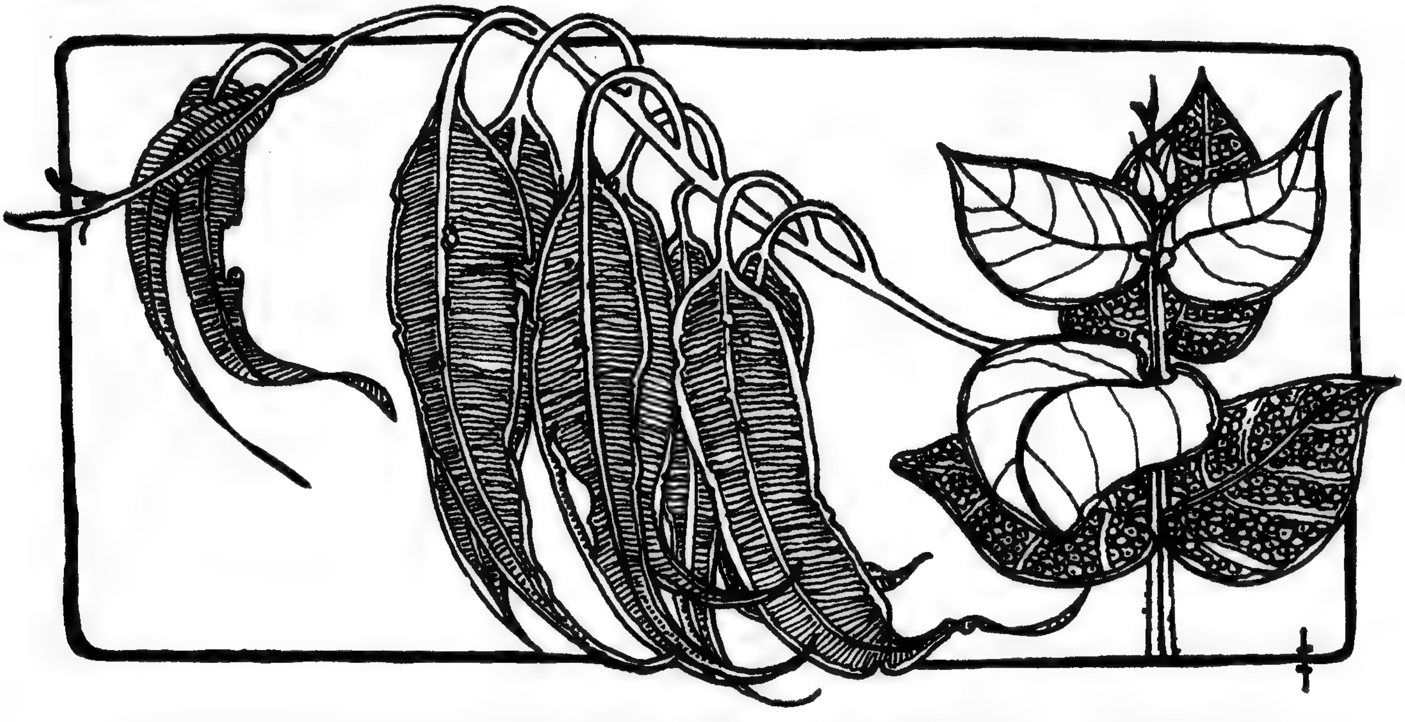
The pigment in the leaves, which gives them their green colouring, is *chlorophyll,* the "green blood" of the tree, an oily substance which contains magnesium, nitrogen, carbon and oxygen. Chlorophyll occurs in minute saucer-shaped green discs called chloroplasts, scattered throughout the leaf.

Working on energy from the sunlight, traces of carbon dioxide are extracted from the atmosphere and combine with water from the roots to produce glucose, a form of sugar. Glucose contains carbon in digestible form, which is the tree's food and builds its living tissues. Oxygen is returned to the atmosphere, which helps to freshen and purify the air we breathe.

Leaves may produce more glucose than the tree requires immediately, so it is turned into starch and stored. Glucose and other sugars are simple forms of carbohydrate which serve as building blocks for *cellulose,* which is the chief constituent of wood.



Plant out the tree seedlings when they are 20-30cm high. Prepare soil and remove grass around the site. Hammer a stake in beside the tree and secure it with soft rag or rope. Water. Mulch thickly with well decayed bush litter or woodchips to conserve water.



Mature leaves of the adult eucalyptus tree (left) and its juvenile leaves often vary in shape and colour.

Trees on the farm

EARTH GARDEN INTERVIEWS TIM COX

Tim Cox is a practical, successful farmer, but one who takes nature into account, providing for birds and animals in a habitat corridor and closely observing what roles native plants, trees (both dead and alive), moths, bugs, bees and bacteria play in the farm ecology.

With his wife Sue, Tim runs a mixed farm of 180 acres of land near Bendigo, Victoria, using methods adapted from organic farming, the Keyline system and permaculture. He is the chairman of the Australian Farm Tree Regeneration (AFTR) Committee and is a farmer on the advisory board of the International Tree Crops Institute (ITCR).

His aim as a farmer is to be "self-efficient", rather than self-sufficient. "We're efficient enough to live in this world without having a Government grant or a handout — hopefully without doing any damage to the environment by our existence," he says.

After a solid farm breakfast, we walked around the three different sections of the Cox farm, and saw the many dams, the floating island, solar electric fences and new tree plantations. Then we sat in the sunshine on the front verandah to tape this interview with Tim, which we began by asking: "What do you see as the importance of trees in farm management?"

I see trees as being, I suppose, rather like the Upper House or the House of Lords. You know, they're the restraining thing in our way of life. We can crash off and do very efficient things like ploughing up paddocks and putting in pastures which are up and eaten within 12 months. But trees are going to take a lifetime and also, of course, they're able to handle problems a lot more efficiently.

A tree, I suppose you could say, can go through years of problems and at the end of it come out and respond to better treatment. Look at our situation here. We've just had three years of virtual drought. I don't think we've really lost many trees, if any, other than perhaps a few that we've planted. But there would be very few that would have been lost from drought. And yet they're all, not in a dormant state, but in a very subdued state. They can hold on, they've got their deep-rooting system. I suppose they're like the human who's got a good savings bank account behind him. He can go through the rough times.

But we've got to learn what we're doing with trees for sure, and I've changed my ways of thinking since I've been here. We started off thinking, as soon as a tree died for instance, "Whacko, this is ours, for the fire." So you went and knocked if off and chopped it up. Now I'm seeing that every dead tree has got to be assessed before we take it. First of all, if we take it out, is it one that wouldn't have made a good habitat for a predator bird for roosting, or for some of the arboreal birds, like the tree-creepers and the night-jars and so forth and the owls that need good, knotty holes to get into?

So, I see a dead tree now as something to be assessed and this is one of the reasons why we've got to look at it, particularly along roadsides. People just go along as soon as they see a dead tree and they don't think they're doing anybody any harm by knocking it off. I think this is where, somewhere along the line, a government body, I guess in Victoria this would be the Fisheries and Wildlife authority and in your case, in New South Wales, the National Parks and Wildlife, should have a means of marking a tree — not so that it stands out like Gina Lollobrigida or something — but so that people who are interested can see that it is *not* to be cut down, it is to be kept. That should also be through the forests and everywhere. Foresters should be trained this way and so should farmers.

I'm sure that this would help us to control things like the mice plagues that they had one or two years ago in the Mallee and the Wimmera. I'm sure they'd never have happened if we'd had the right bird population. The predator birds used to control them before we turned up. And it's not as though when Captain Cook arrived, there was a plague of mice to greet him on the shore. A lot of them are native mice. It's not as though they're all house mice that came in on the ships. They're part of our system too and, no doubt, if we were to do research on them, the mouse is probably doing something for us in another form of control on something completely unrelated that we don't understand at the moment.

We're in a situation here in which our land was basically not cleared, but had an order on it from the government of the day which thought that in the 1950's we had to increase productivity and the only way to do that was to knock down the timber and put in crops. As we had a large part of our place which was under an Improvement Purchase Lease, this meant that we had to clear large areas of it. We started off doing that and then from that we found that it was necessary for us to revegetate to a certain extent.

Now we're looking at it a little bit differently, possibly not correctly, and I don't claim that I'm doing the right thing here at all. We looked at it and said, "Right, well every tree that we plant has got to fit." We then set a standard, or a train of thought for the selection of our trees. Our trees had to be able to *one*, be native to this area (if we were planting natives that is). They had to be suitable for the soil type that we were playing with — and our soil here is largely *Ordovician* period, so that we have everything from good basalt soil to poor sandstone.

We then had to be able to see a use for this timber. We used to have a lot of brown stringybark in this country. I couldn't see any use for it. One of the reasons was that it was being barked by cattle. Nobody has been able to come up with a reason why cattle will bark trees. Just at the moment we're using the Australian Farm Tree Regeneration Committee (AFTR) as a way of getting the message out to people to see if they've got any idea why. We've had one feedback from a man who said that he'd managed to control this by feeding sawdust to cows. There's something they're looking for in the bark, but nobody has been able to identify what it is.

A lot of people said, "Oh, it's simple, it's only roughage." But when you think of it the time that the cattle want it is in the late winter, when we've had them on hay anyway, so one wouldn't think that there was any difference between the two. Scientifically, there possibly is, but certainly it's not *just* roughage anyway. a lot of people thought it was minerals. They tried extracting the minerals from the bark without success. Whether or not it's a form of mineral that's basically available to the cow, or whether it's like ice cream for a child, whether it's a craze, I don't know, but it happens regularly.

It's been reported to us from as far away as Coryong, down to Gippsland and across to here. It's *exactly* the same time, *every* year, in August-September, they aren't worried about it at any other time of the year.

So we didn't think that tree was of any use to us. On the other hand, I've started to realise that there are certain birds that need the fibre from the stringybark to be able to nest, so you can't knock it right out. So everything we're planting will have a definite use.

We've tried to have trees that would provide us with, basically, shade and shelter. If possible, they've got to be able to produce honey, fence wood, logging wood, or firewood. If we can, we like to get a legume into it. They've also got to be able to handle the situation, whether it might be in wet clay or dry stone areas.

They've also, for specific uses, got to be fodder productive if we can manage it. Now I'm thinking of *Gleditsia*, the honey locust. With them you get a working tree, needing little attention. You get a paddock of, say, 35 Gleditsia to the acre, which is not just being planted willy nilly. You're planting them so that you can run your equipment through and you can be doing your pasture improvement work at the same time. That paddock is producing the equivalent of 105 bushels of oats per acre. This has been found in America and in New Zealand.

There is also the other use for the pods. You could be taking alcohol off them and making them into a fuel. They're doing this in research. I'm tied up with ITCI, that's the International Tree Crops Institute, as a farmer on the advisory committee. Henry Esbensharde, president of the United States chapter of ITCI, who was out here recently, told us that they're taking the alcohol off and leaving a residue suitable for stock feed, so you're still getting your stock feed.

That tree is also deciduous. You're getting leaf fall, either in the form of leaf mould or stock feed and for our country here, where we've got predominantly winter rainfall, it means that we've got the sun getting to the ground in the winter when we want it to, to try to keep the ground warm and in the summer shading it, to try to keep the ground cooler.

Gleditsia also happens to be a legume and in California they're using it for soil erosion control. So there's another thing that comes into your reasons for selecting trees, the different jobs that you have on the farm: it may be soil erosion, it may be drying out of a particular area, it might be keeping a road from getting too wet or too dry (stopping dust for example), or it might be for feeding animals or birds other than the ones you are actually farming.

Bob Davidson at the CSIRO is studying the pasture pests and their predators from native plants. This is how his work interests me. We've got to look at a very broad pattern of *Acacia* (wattle) growth and research is going on to see what wasps are working here and which wasps are in fact predators on things like pasture scarabs. You go and ask the average Department of Ag. man, "What do you do against pasture scarabs?" and he'll tell you to get out the spray gun and spray with such-and-such. Okay, that's his education.

Now that we're starting to realise that certain birds will also deal with scarabs, we've got to plant trees to suit these birds. So we get another type of tree requirement and that is habitat, for such things as magpies. It's also good having your plantation of trees in a straight line across a paddock for magpies. They don't like that. They like to have a little bit more of a group effect because they are frightened of *their* predators, which happen to be the goshawks and so on. Unless they've got a pretty broad canopy over the top, the goshawks can get through to them and their young in the nests. They want a bunch of trees, so another bit of planning comes into it.

You'll see quite a number of magpies here in the paddocks. When you see them with their head on one side, it's not because they haven't a clue what the hell the time is or something, they're listening for scarabs, chewing away at the roots of the grasses. As soon as they cotton on to where the scarabs are, they dig them out and that's it.

Each magpie is knocking off about 40 of these little brutes every day. You multiply that up too—I think the average magpie has an area he works of about a hectare or so because he's able to feed himself off that area. He's keeping down the pasture scarabs. Somebody said to me the other day, "Well, he doesn't kill them all." I said, "That's alright — you don't kill all your sheep." No predator kills everything. You get it in balance and that's all we really want. So that's another use for trees, habitat.

Some trees, like the *Gleditsia* do better out in the middle of a paddock on their Pat Malone. They've found this in America, but we're trying them under different circumstances to see what they do under Australian conditions. We're assured that California is very similar to our situation, with soil types and rainfall, pattern and so on. So, okay, we're trying everything in that line.

Another thing we are learning about is the birds that are predators on sawfly larvae, which are capable of defoliating young Red River Gums. These include the cuckoos. Now the cuckoos need the hosts nests of other birds, so we've got to be able to attract in the other birds to provide the cuckoo with a habitat that he enjoys before he'll go looking for a feed.

We then look at the birds that we've got as hosts to the cuckoos and we find that most of them like to have a small, shrubby tree. This will be in our habitat corridors, so I think we're going to have to fence off the habitat corridors completely from cloven-hoofed animals. I don't think the kangaroos would worry us because they've never worried us in the past, but certainly cloven-hoofed stock do. You've only got to see where anything from goats to cattle go and they completely ruin any revegetation that's done. So, we've got to fence them off. We've then got the problem of what may be needed for the predators, for control of scale, or whatever and so the picture goes on. It gets broader and broader and no wonder the average scientist, who has a very set train of thought, finds if frightening to try to compete with it.

We've had success with the three-cornered plastic guards we've been using with tree seedlings. These were given to us five or six years ago for trial by the young man who developed them. We used them through the last three years' drought and we were staggered with the success we had with them.

We noticed that they are able to condense moisture even in the heat of the summer and in the middle of a drought. We went through six months with only two inches of rain through our summer last year. That was colossal, but there was still green grass growing inside the guards. The only trouble was, of course, that this was attracting in rabbits and sheep.

There is a two-fold benefit here. First the guard condenses and you can see the moisture running down early in the morning and, secondly, it stops the wind. I'm a great believer that the wind does more evaporation than the heat does in Australia. I don't really go along with the old idea of dams being cooked in the heat of the summer and the moisture rises off them. Look at Mum's washing line, it's the place where all the moisture leaves very quickly. That's why we try to plant trees all round our dams, so you can say that's another use for trees.

The more I think of this hare-brained idea of mine, that we should have habitat corridors following watercourses, the more it fits in. It fits in from the point of view of controlling evaporation, it fits in from the point of view of making wind-breaks and it fits in from the point of view of erosion control.

A habitat corridor should be wide enough to contain trees, understorey and ground cover over an area that will control soil erosion in the watercourse without causing blockage or interference. A channel to transfer water to another area or location would be just as suitable as a natural watercourse.

If there is a worry about bushfires in having native habitat corridors then, okay, you can have a break of 200 yards and animals will still hop across, or birds fly, or wasps or anything else will be able to transfer across that gap. You don't really need that much distance, of course. You can have a road, or you can have a dam and stock access for water — whatever else you want — there's no problem about it, because you've got that flexibility.

In some places, farmers are going to be able to say to you, "Look, we haven't got a water course area in this paddock, we've only got a fall of three feet in four miles." Okay, they've got the problem of finding it and they probably have a totally different environmental requirement, but they must have some part of that paddock that's lower than the rest and they've got to know that part before they start.

Another aspect is that it's helping with the health of your animals. With sheep, the place that they pick up liver fluke, or footrot or foot scalds is where it's wet, so you keep them out of it. It's assisting us there, if only we give it a bit of thought.

You can have trees anywhere around the dam, not on the dam wall, because there you get into the problems of roots. You can have them farther away and below the dam and put some very big, tall stuff in there. Then, above your dam, go straight up your watercourses. On either side you can fence it off.

If we were to redesign all our fence lines, I suppose we'd put them along the crest of a hill, where you'd have your roadworks, and then along your watercourses. Before this, we've always gone straight across the watercourses, instead of along them. Then combine that in with Keyline, so that you have your transverse watercourses, or your cross-member fences following your contours and we should be able to find a very simple pattern for the development of the farm. Regrettably we hadn't thought of this when we first started.

I don't suppose we have broad enough acres to do that, because we've only got small valleys, but any bigger valleys would be suitable. I suppose one should go along with the idea that we should really be changing the boundaries of farms. The old idea of putting in 4 x 4 squares, one mile each way, to give a bloke 640 acres, was all very well, but it's certainly having a detrimental effect on productivity now.

The early farmers didn't understand it and most of them came from Britain, where there is no problem like this. I think this is something that we're starting to learn now that Australia has a very special way of being handled. We're starting to mature now and realise that there is only one way to do it and that's start from the ground upwards.

Now, whether or not we're big enough to take this and realise it, or whether there's got to be a catastrophe first, I don't know. I think we're starting to realise that we need to find a way of farming for Australia. The *need* to find it has been quite widely understood and accepted, but I don't know whether we're finding a way yet. That's another matter.

I think that this will be something that will turn out in our lifetime, such adverse things as the fuel crisis and so forth are starting to make us realise that systems like bio-dynamics, for instance, have got a place and have got to be understood. I wish I could understand it. It interests me that our way of doing things here is very similar, in a lot of cases, to bio-dynamics, but we don't spray with their preparations and sprays.

At this stage I don't think I could go by the rules for various things which they have, but I respect Alex Podolinsky for what he's done. There's no doubt about it, there's a large number of people who have succeeded under his principles and the ideas of bio-dynamic farming, but I think he'd probably condemn me as a member for some of the things I'm trying to do.

But what I'm not quite sure of and it's just the same with the Wallace plough (which we've had here), is whether it's suitable for our particular situation *as it is at the moment*. This is another thing: no two places in Australia are the same, just as no two Australians are the same. We're all individuals. And each paddock is an individual and each part of a paddock is too.

I think Geoff Wallace's plough, the *Wallace Soil Reconditioning Unit* as he calls it, is ideal for the kind of place where he's using it, the Kiewa Valley and also the Goulburn Valley, all down through the irrigation areas, particularly in dairy country, where you have cloven-hoofed beasts trampling the ground into submission the whole time.

Now there's no reason to go and turn over the sod — I'll go along with that one — if you can lift it up, like his plough does, I think they're doing a terrific job. Look how they're now doing it in America, all around the world, but big, much bigger than that, on the same sort of principle. And really the Wallace machine is only a development of P. A. Yeoman's chisel plough principles.

Here we're still in the juvenile stage. We're still using and needing a chisel plough. If you want a controversial thought, this is where my reckoning comes on the kangaroo as being a better meat producer for Australian conditions, generally speaking. Not in the irrigated areas, perhaps, nor in some of the areas where cropping is being done, but definitely in marginal country. We certainly wouldn't have the erosion that's such a problem right through all the marginal country of Australia.

The only artificial fertiliser we're using now, as a trial, is *Osmocote*. The reason for my thinking this is worthwhile is that we've got a very high iron content in the soils we're using. This means that any time that we apply a fertiliser of a sulphate or phosphate type it gets bound up immediately in the soil. It's one of those chemical problems. If we therefore put in something like Osmocote, which is a slow release fertiliser, the thought is that this will give the tree a greater chance of establishment, so we're trying it. I'll let you know how it does in five years or so.

Until now we've never given our trees any fertiliser at all not for the natives, that is, The English oaks, yes, there we've given them pig manure. I thought to myself, "Well, in Spain they feed the pigs on oaks," so therefore the oaks must do alright out of the pig manure. That's certainly done very well.

Another thing we do is mulching, which is particularly important here, where we've got a predominantly winter rainfall and predominantly dry summers. I think it's generally safe to say that, right through Australia, it wouldn't do any harm to mulch.

We're now trying to mulch with what you might call the "parent tree". With the oak trees, we went and got oak mulch, oak leaves. I'm not sure that there isn't something in those oak leaves that isn't of benefit to the seedlings. When you think of it, where do the seedlings come up? Why is the tree dropping the leaves anyway? It must be something to do with nature trying to recharge the soil beneath the tree and make a habitat so that it can reproduce.

The same with the *eucalypts* then. We've got ourselves a fairly big chipper, big enough to take five-inch logs. So, whenever we're clearing, anything that's bigger than five-inch goes into the stove and anything that's smaller than five-inch goes into the chipper. We used to fire this stuff, just to get it off the place because it was a fire hazard. This comes into the management side of things on the farm — fires and timber.

This is one of the things we're trying to get over with AFTR, to try to help the farmer understand that trees aren't a hazard for fires. They found, down at the Streatham fire in, I think, 1978, that some farms were protected by trees, and the fire raced across the grasslands, came to the trees and was slowed down. The trees, possibly, were killed, but the houses were saved. They were able still to fight the fire there because it slowed down sufficiently to be able to get at it.

Mother Nature then says, "Right" and up come seedlings. It just wasn't quite what *homo sapiens* wanted because there he had his beautiful shade belt and now he only had little shrubs coming up among the dead trees and this didn't look very nice, but, when they thought about it down there, they began to realise that there was a definite reason for it.

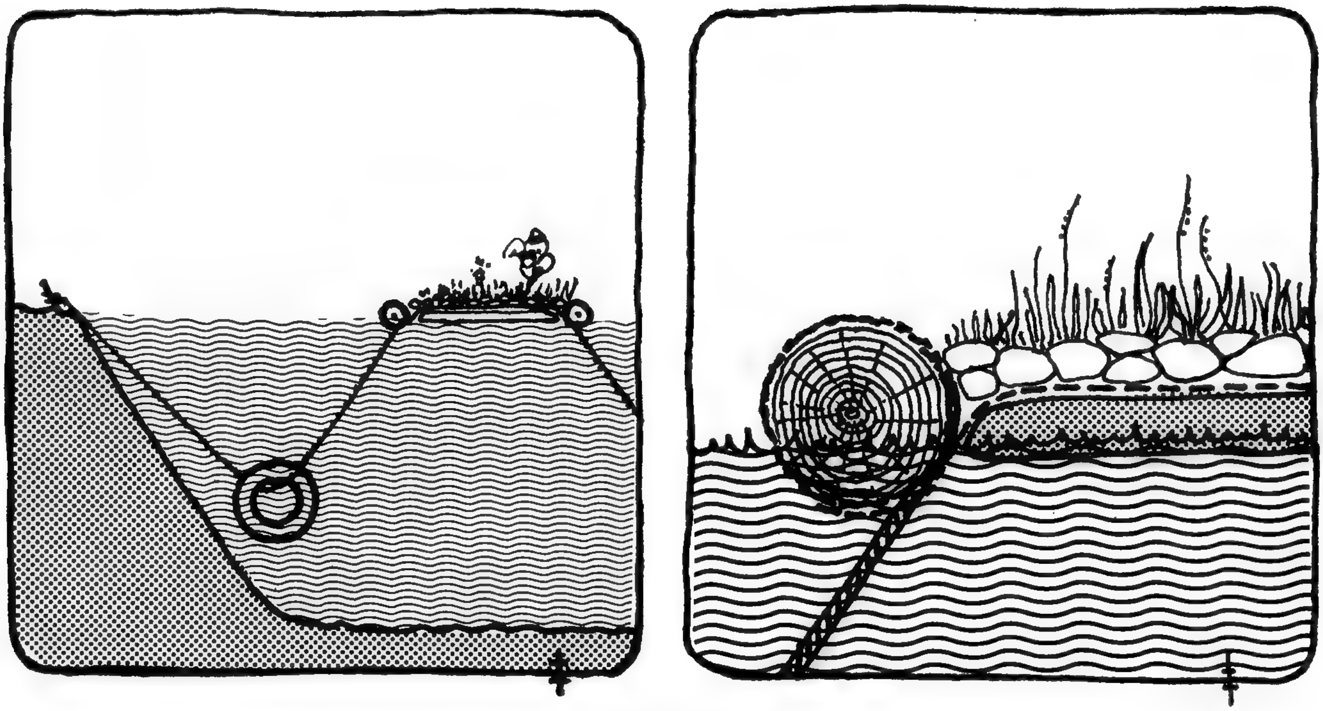
So, here we come up against another problem about trees — you shouldn't "clean up" underneath them because you've got to have somewhere for the ants and slugs and frogs and all the different bacteria and fungi and God knows what else. You used to think it was hunky dory, you just go and pick up the stuff from the forest. Now one's got to think about leaving areas.

This cuts across the general idea of cool burning. I don't think anyone has realised the significance of this. No doubt they can still burn off in corridors to give fire protection there, but they shouldn't be doing complete areas. Of course, I can't say that they *must* not!

Here we take fire precautions insomuch as we *eat*, with our stock, clear areas, so we make hay in certain areas to protect buildings particularly. I suppose you then have to look at your assets. You ask which asset is most important and I put it down to the house. Having a house, you can then go out and rebuild what you've lost. If you haven't got a bloody house, you're back underneath that piece of canvas and it's not much fun. With a house, you've got a means of communication with the outside world, you've got a place in which to keep your information and that sort of thing, so that's your number one priority.

You'll notice how this house, by pure luck as far as we're concerned, has been developed on the permaculture system. We've got a creek to the north-west and around it the willows, giving us a barrier. We've got a road on the other side, which is giving us another barrier. It's got a lot in its favour. We're at the bottom of a hill so that it's the slowest point of approach of the fire, except one coming out of the south-west, which is the most unlikely place that we'll get a fire coming from. Down at the bottom of the hill, we've got another road access.

We had a fire only last year started by shooters. Shooters are one of my pet problems. These shooters



FLOATING ISLANDS

Our reasons for liking floating islands are basically:

(1) They are safer for breeding nests for birds;

(2) They do not decrease the water content of the dam;

(3) They do not dry out, so that water plants remain in water all the year round.

The island is made out of four treated pine poles. Around the outside between these poles is a piece of PVC coated chain wire mesh. Under this mesh is a slab of polystyrene to give needed buoyancy and to provide a platform for soil and mulch to make the island grow plants other than water weeds.

It is moved by two plaited poly baler twine ropes which are held underwater by car tyres placed at a distance from the island so that when the water level falls the extra rope will be available, so constant attention is unnecessary. This also keeps the ropes below ducks' paddle paths.

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were kids who'd got bored. There were no rabbits to shoot, so they were shooting at the power lines. Believe it or not, they managed to shoot them down. You see that hill there behind us? It came right over, straight towards Luigi's (a 70-acre section of the farm, with a mudbrick house). Away she went, blowing from the north-west. *Whoomp!* We were lucky it was sighted very quickly and within a matter of about 20 minutes we had 16 fire units on the job.

That was one instance. You can't control every fire. Let's face it, you can make the best of what you've got. I've been wondering if the idea of an underground house isn't the ultimate protection. You go back to the old castle. They had a moat around it and a drawbridge. As I see it, in an underground home the soil is your moat against the fire and you have thumping big, steel shutters, which just trundle out on tracks to cover your windows and doors. There you are, you can go down there and smoke the pipe of peace until the fire is gone, then get out and repair the damage.

You could rest assured that your family was safe and your assets, as far as knowledge, were all there and would not be burnt. That is, as somebody said, unless you happen to be a smoker and knock the place off from inside. An underground house is really only suitable in hill country. You can then get your view without being in the hottest part of the fire. You've got natural insulation and you've got drainage away. If you had too many houses underground in the city, you'd have a lot of problems with water. I think you'd be in dire trouble.

You will have noticed the emphasis on polyculture, a diversity of crops and livestock, running through this whole talk. The trees are an integral part of this. Farmers have been taught to become specialists. I hope we'll be able to reverse this and they'll start to become more general purpose farmers. We've got to start to think *nature*. The poly outlook, really, has to come from a deeper understanding of nature.

I suppose the world is developing so fast that we've stumbled over poly work and found that monoculture (single crop farming) is much easier — if we succeed. Then we haven't realised that mono can succeed for one, two or three years and suddenly we get the crunch. Look at the problems they're having in America, where they're getting a decreasing productivity from their wheat lands and they don't know why.

Louis Bromfield was telling us why in *Malabar Farm* in the 1940s and he could see that monoculture was not the right thing and that he was producing more from his land with a general type of farming. He was probably doing more for his men and himself mentally as well. They weren't geared to mono thinking, so they were active the whole year, not just at the critical time for one crop. They didn't have time to whinge about their problems or the things that went wrong.

This is the thing I find about general farming, as I term it. One thing is a damn nuisance, but it's usually of some benefit to something else. We get a drought and people say, "Oh hell, we've got no feed and the stock are dying already. "Yes, they are, but so are the sheep worms which are a problem in the pasture, or you may find that your weeds are being cut back, so you are able to control them. On the other hand you may be losing your weaker sheep.

We've never been able to accept that there is not a benefit in everything if only we looked at it. Of course the economist can't see it. He sees 10 sheep die and says, "There's 10 per cent of your flock gone," or whatever it is. This sort of thing is hard to get through to economists, or to any modern, educated person. I'm always trying to look for reasons why it happened, because I'm never willing to believe that it's designed to get rid of me, shall we say. There must be a way of taking advantage of everything. People ask, "What about war?" Well, some of the best inventions came out of war and some of the best health things too.

Successful farming is very much a matter of observation. We had a cow and suddenly her milk started to taste distinctly different. It was getting a very tart, rough taste. I said to myself: well, she's getting to the end of her lactation, we've had to extend her. We lost another cow — she drowned — so we've had to extend her out until the next one comes in. If you were cow and you had a calf that just kept on milking you and you couldn't kick it out of the way, what would you do? You'd make the milk taste so the calf wouldn't like it. It's much the same as the way they used to paint children's thumbs with stuff to stop them chewing their fingernails. Mother Nature's up to this one!

Anyhow, it just so happened that we were talking to Vin over there, who's a dairy farmer and we asked him if there might be anything that would make a cow's milk taste like this. "Oh yes," he said, "late lactation." There it was, it was all known by other people, but you could think it out and start to get a bit of confidence in your thinking and perhaps then you're starting to get on the tram track of nature.

The habitat corridor is rather like a nature bank, and we don't know what's in the bank account. It's important to realise the hidden assets. We've got to accept them and keep on trying to find out the reason why. Of course, I don't think man is capable of *making* a total environment. We can see that it's got to have bugs, beetles, bacteria and fungi. Providing the controlling factors are all there, there will be a nice balance in the course of development. Man can help, yes, and I think man must have that much confidence. He can help in developing things, but he should never be over-confident or he could wreck it in the attempt.

Australian Farm Tree Regeneration Committee (AFTR) may be contacted at PO Box 105, Springvale, Victoria, 3171.

Square Foot Gardening

Mel Bartholomew, Rodale Press, Emmaus, Pennysylvania, 1981, paperback, 347 pages. Price $13.50. Our copy supplied by ANZ Book Co.

The idea seems strange at first, but square foot gardening, like box gardens and container gardens (see EG30), uses a tiny space to produce a lot of vegetables.

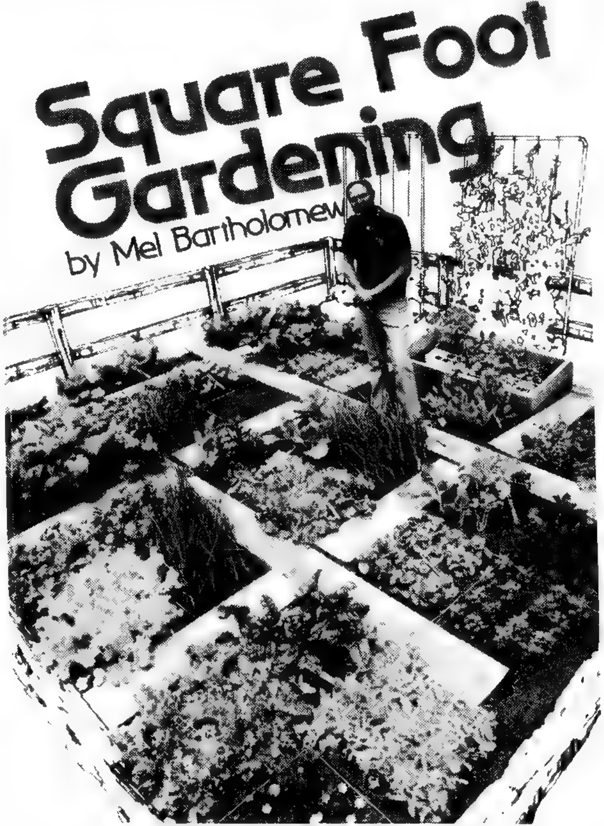
The system is based on a series of one foot squares in which single seeds or plants are placed at the correct spacing. For example only four lettuces go in a square, though you may have several squares of lettuces, perhaps planted at different times, for a succession of salads.

Working on the "small is beautiful" principle, you therefore take up less space for your garden, spend less time and effort thinning, weeding and preparing the plots, use fewer tools and a lot less water.

Mel Bartholomew says that a square foot garden will only take up one-fifth the space needed for a row garden and so saves about 80 per cent on watering. He suggests that the other 20% of water be applied by dipping one cupful of water for each plant from a bucket or watering can.

Climbing and sprawling crops like cucumbers, butternut pumpkin, peas, beans and tomatoes are grown on a vertical trellis to save even more space. It is a super-efficient way to save wastage of seeds — in the case of those lettuces, for instance, there may be 1000 seeds in the packet and you plant only four seeds when you need them.

This is what Mel got from four garden squares (a 4ft x 4ft area or 16 squares) in two months: 32 carrots, 12 bunches leaf lettuce, 18 bunches spinach, 16 radishes, 16 scallions, 16 beetroot, 9 Japanese turnips, 5lb peas, 1 head cabbage, 4 heads Romaine lettuce, 1 head cauliflower and 1 head broccoli! One group of plants goes into the square as soon as the first lot are harvested.



The book is packed with gardening hints and variations on the square foot theme, including raised wooden planter boxes for the patio (ideal for disabled gardeners), starting plants from seed and preserving and cooking the produce.

You won't need any further convincing if you take a look at this book for yourself. And just think: less garden space — more room for the bush!

The low-down on low cost homes

Low cost country home building

A handbook on the essentials of low cost construction for the guidance of rural homebuilders.

Technical Assistance Group, Dept of Architecture, University of Sydney, published by NSW Department of Environment and Planning, Sydney, 1981, large format paperback, 119 pages, illustrated.

Price $3.50 posted from Dept of Environment and Planning, Box 3927, GPO Sydney, NSW 2001.

A government department has unbent to respond to a genuine need by a section of its citizens. The result is this innovative handbook for homebuilders.

The book itself is exciting, it's a landmark and its implications are enormous. Its origin lies in a seminar on Hamlet Development in NSW in 1979, when the former Minister for Planning and the Environment, Paul Landa, promised that "experimental building areas" would be set up to "test new building forms and materials for residential developments".

In a Foreword, the current Minister, Eric Bedford, says that this book is not a final document, but for public discussion. "I feel certain", he says, "that it will help those with limited expertise in home building by providing information which is not otherwise easily available on low cost materials and forms of construction. All methods of construction and the materials described in the handbook are within the framework of the State's building regulations."

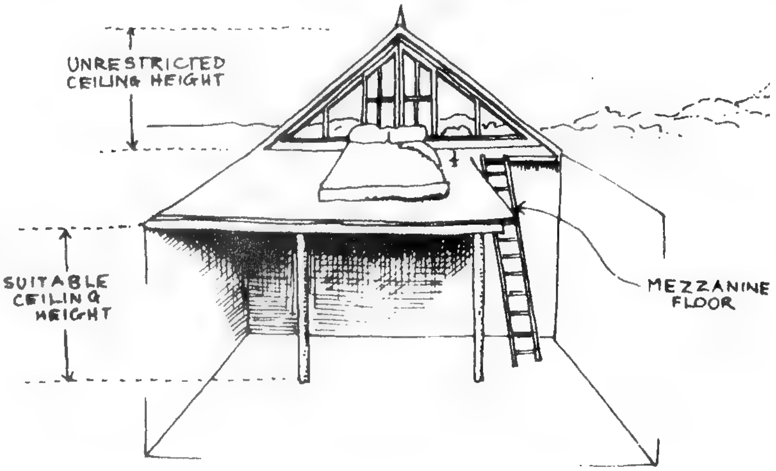
For people living in New South Wales, here is your guide and helper through the complicated maze of Ordinance 70 of the Local Government Act, 1919. It is a document that should help to smooth relations between councils and owner builders.

For anyone in Australia who wants to build a home in the country, here is a book of advice and techniques which should be a basic source and stimulus to your efforts.

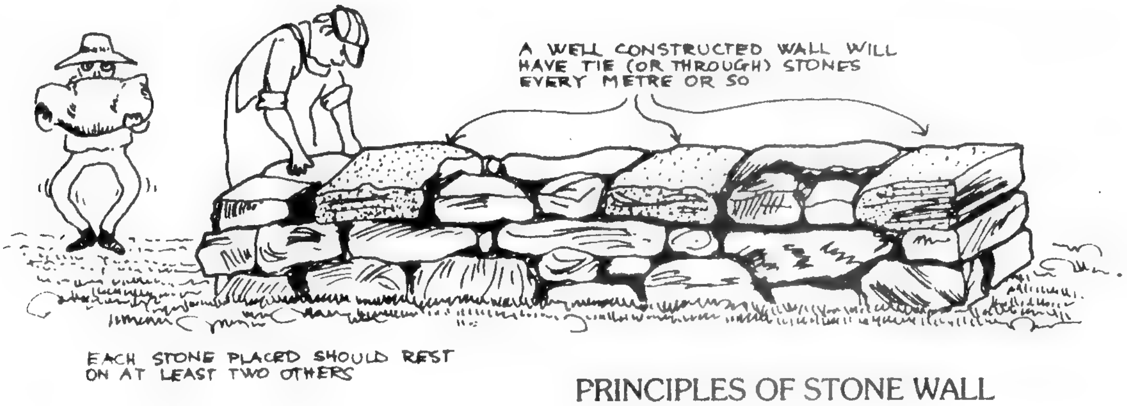
MEZZANINE FLOORS

Where a mezzanine floor is provided (Part Two, Definitions) the ceiling height above and below the mezzanine is not included in the restrictions set out in 16.3. The maximum area of a mezzanine as a proportion of the floor below it is not specified, but this publication recommends that it not exceed two-thirds of the lower floor. Regulation 41 of the Public Health Act requires sleeping areas to have a minimum available air space of 14 cubic metres per person.

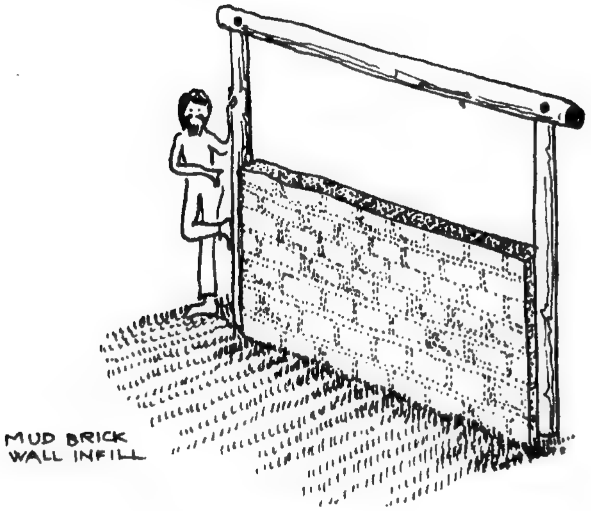
In addition, a means of escape should be provided from mezzanines or second floor areas, directly to the outside of the building — for example, through a window to a lower roof, thence to the ground.

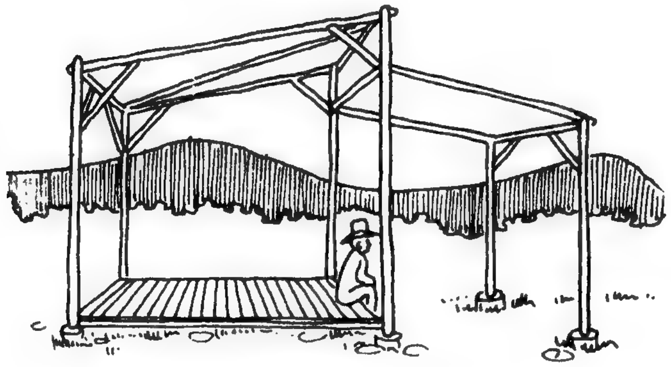


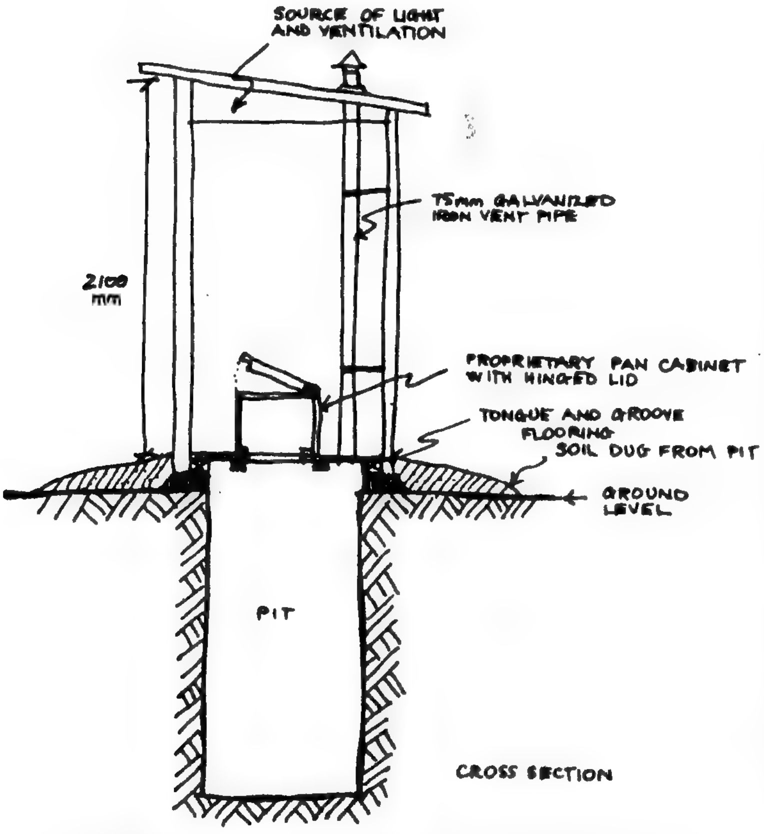
CEILING HEIGHTS WITH MEZZANINE FLOOR


A WELL CONSTRUCTED WALL WILL HAVE TIE (OR THROUGH) STONES EVERY METRE OR SO
EACH STONE PLACED SHOULD REST ON AT LEAST TWO OTHERS

PRINCIPLES OF STONE WALL CONSTRUCTION






SOURCE OF LIGHT AND VENTILATION
75mm GALVANIZED IRON VENT PIPE
2100 mm
PROPRIETARY PAN CABINET WITH HINGED LID
TONGUE AND GROOVE FLOORING
SOIL DUG FROM PIT
GROUND LEVEL
PIT
CROSS SECTION

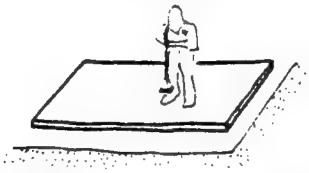
CESSPIT WITH CABINET ON LEVEL SITE

The people who took on the job of compiling it, members of the Technical Assistance Group (TAG) have done a brilliant job, drawing on help from assistants and practical experience as architects and engineers. They are Colin James, Richard Aynsley, Patrick Healy, Graham Holland, Warren Julian and Brian Woodward.

The artist, who is not credited, has also made a major contribution, with clear, helpful drawings. The text is simply expressed and technical terms are explained by definition and glossary. Some of the subjects dealt with are: making applications for owner building permission, writing letters to local authorities, selecting the homesite, summer/winter sun orientation, building methods to acceptable standards, foundations, footings, sod roofing, mezzanines, pole building, mudbricks, pise, earth floors, solar water heating, sanitary disposal, guidance on hamlets, minimum size housing (with plans and specifications) and many other useful details.

The implications? If this book is well used, it could result in homes being built for people on a scale that is small and simple; in the use of natural materials such as timber, stone and earth; in a nurturing of skills and a satisfaction and feeling of achievement for a generation of young people; in new areas being settled; in families being started and in hamlets and villages which will merge with their environment.

The first homes built will be enough to prove that our enthusiasm for *Low cost country homes* is well-founded. This is one of the best books on home building we've seen in 10 years — the Great Australian Dream for $3.50!



The need for this handbook arose from the housing aspirations of new settlers in rural NSW, particularly within the North Coast region. An increased awareness of environmental values together with a desire to lead a simplified lifestyle has led to a re-evaluation of rural building practice. To meet these needs, many new settlers are building their own homes using local materials and both simple and traditional building methods. These techniques have been particularly useful in providing emergency and very low-cost accommodation.

Under these circumstances it has been found necessary to provide improved information for aspiring home builders, particularly with regard to siting and building healthy and safe housing within the State building regulations. At the same time, information has been provided to guide Council building officers in their interpretation of the building ordinance to allow them to provide a more effective service to homebuilders.

Colin James in the Introduction.

Apart from statutory responsibilities, an owner of a building has a general common law responsibility in relation to building work. The work must be undertaken carefully, with due regard to the safety of the future occupants of the building and the interests of owners and occupiers of other properties in the neighbourhood. This does not preclude low cost building and the use of second-hand materials. It does mean that care should be taken to ensure that appropriate, sound materials are chosen and that proper building techniques are used.

Part of a statement of "responsibility and liability" by Murray Wilcox, QC.

earth building

Mudbrick notes

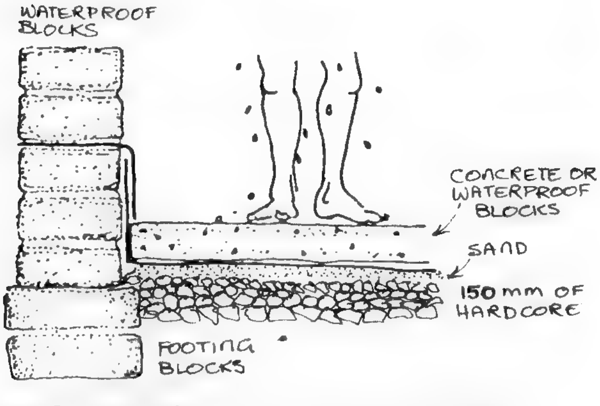
Ry Mitchell & Brian Woodward, large format, roneoed booklet, illustrated. Price $2.50 posted from Earthways, Wollombi, NSW 2325.

This is a modest title for a booklet which offers a cheap, short guide to building a mudbrick house and which is crammed with the practical experience and knowledge of its authors.

The underlying philosophy of self-reliance, simplicity, energy saving and respect for earth as a beautiful and natural building material is spot-on. It is obvious that both Brian and Ry are deeply convinced of these values and we know that they are already putting them into practice in their lives at Wollombi.

Mudbrick notes covers the various techniques, looking at pressed earth blocks, pise and pise blocks, then chooses adobe or mudbrick as the most appropriate of these for many reasons. Design and site considerations, sod roofing, earth floors and fireplaces and surface finishes are all included. Recommended.

> **The imagination is readily stimulated by discussion of the possibilities of earth construction, but the adventure of taking your life in your own hands is sometimes intimidating. These notes are designed to give the detailed practical advice that has so far only been possible in the verbal mode, and so to encourage the early steps out of the manipulated system into the free world of self-help and self-esteem.**



Earth-Construction — An Advisory Document

Graduate School of the Built Environment, Faculty of Architecture, The University of NSW, booklet, 30 pages, illustrated. Price $2.50 from Earthways, Wollombi, NSW 2325.

This document is the result of a seminar at the University of NSW in May, 1979 and contains technical information relating to strength and durability testing of mudbricks. It will help council and building inspectors evaluate earth as an acceptable building material.

EARTH BUILDING BOOKS

State of the Art

Homes built of earth are a "natural" in Australia and the books written here on the subject of building them are the best on earth!

A quick summary of best bets:

- Cheap, short, practical introduction: ***mudbrick notes,*** by Ry Mitchell and Brian Woodward.
- Mix of practical/inspirational: ***Dirt Cheap,*** by John & Gerry Archer (see review EG 17).
- A practical manual, updated: ***Earth-wall construction,*** G. F. Middleton (revised L. M. Schneider).
- Still the best all-round for mudbrick and pise in one book: ***Build Your House of Earth,*** G. F. Middleton (revised Bob Young).
- Inspiration by colour photos: ***Home Made Houses,*** by David Liddle & Ann Taylor, ***Improvisations,*** by John Archer & ***Living Shelter***, by Peter Re ("They did it, so can we").
- Aesthetics & philosophy ("We are what we stand on"): ***Living in the Environment*** & ***Alternative Building,*** by Alistair Knox.
- First-person building reports: ***Mudbrick primer*** in Earth Garden 29 (includes ***The mudbrick monastery***).

BUILDING ADVICE

Earth Building Forum (EBF)

67 Colin Street, Cammeray (Sydney), NSW 2062. Phone: (02) 922 2461.

Earth building forum is made up of a group of experts in design, construction and research set up to help with information and assistance on earth building.

Its stated objective is:

"To recognise and support the owner builder and to promote appropriate, low cost building through the use of natural low energy principles and materials such as earth, with particular reference to mudbrick."

The EBF is in contact with government authorities, lending institutions and councils and they are willing to help anyone who is having problems with loans or permissions in building their house of earth.

Mudlark Builders

8 Grahame Drive, McMasters Beach, NSW 2251. Phone (043) 82 1872.

Rick Haughton and Dael Allison of Allison Haughton Builders (see *Building Skills,* Earth Garden 29) are now also called Mudlark Builders (BLB Lic No 21896). They offer a design and construction service in adobe and alternative building, especially for owner builders. "We've had nearly a dozen designs passed by local councils and we are happy to design for and work with people further afield", they say. "We can travel for on-site consultation and construction supervision."

Earth building courses

Dr Robert Rich, Moora Moora Co-operative, PO Box 214, Healesville, Victoria 3777.

Bring your gumboots for Bob's one day courses in earth house building. They run each second Saturday of the month during spring and summer and will cost you $25.00. Bob will also consult on house plans, soil samples and building problems. Send SAE for details.

Earth-wall construction

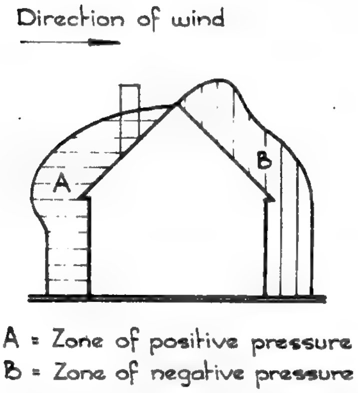
G. F. Middleton, revised by L. M. Schneider, Bulletin No 5, Experimental Building Station, Dept of Housing and Construction, Canberra, 1981, paperback, 88 pages, illustrated. Price $5.55 posted from Experimental Building Station, Box 30, Chatswood, NSW 2067.

This revised version has been expanded considerably from the 46 pages of the original 1952 edition and the 60 pages of the second edition of 1976 (which was reprinted in 1980) — an illustration of the reawakening interest in earth homes.

Laurie Schneider of the EBS had added a section on pressed blocks (Cinva-ram) and soil strength and erosion tests as well as new photographs, some in colour, of the various techniques, particularly mudbrick and pise. One Plate which shows a group of mudbricks made from varying soils brings home the wide range of colours — from olive, through gold and brown to ochre — available to Australian home builders.

This is a comprehensive book, covering every aspect of earth building, from the footings upwards, with details on building adobe moulds to pise and formwork, selection of soils, damp-proofing and methods for making a dwelling cyclone resistant.

> **In recent years there has been a massive revival of interest in earth-wall construction to the extent that it is now included in the curriculum of most of our schools of architecture . . . This revised edition, while still aiming to be practical, attempts to place the various methods of construction and the selection of soil on a scientific basis and to set out standards which, if followed, will produce buildings as structurally adequate as those built of other materials.**
>
> **It is intended also that this publication will give sufficient guidance to local-government bodies to enable them to assess applications to build in earth-wall with the same confidence with which they assess applications to build in full brick, brick veneer, concrete block and so on. To this end the standards recommended are comparable to those required for other materials and assume compliance with existing building regulations. It is stressed that earth-wall construction is a viable method of building and its use is not dependent upon the reduction of normal standards.**



WIND PRESSURE ON BUILDING

Experimental Building Station

Box 30, PO Chatswood, NSW 2067.

The EBS, a section of the Commonwealth Government's Department of Housing and Construction, is "up for sale" to private industry — a victim of the Liberal Government's "razor gang" cutbacks.

Many useful publications are still available, so we suggest that you write now for a list of publications. These include *Bulletins*, such as *Earth-wall construction*, Technical studies, special reports and a long list of *Notes on the Science of Building* (the last are 20c each), with titles such as No 21 House design for temperate climates, No 31 Domestic fireplaces and chimneys, No 34 Timber in domestic buildings, etc.

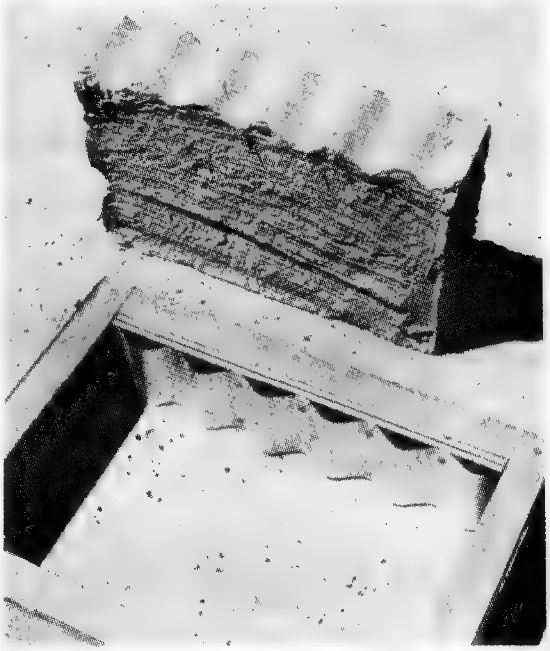
NOTHING NEW UNDER THE SUN DEPARTMENT

On the subject of the antiquity of earth building.

In his book *The Ascent of Man*, based on the famous BBC television series, Prof Jacob Bronowski, shows this picture of a dried mudbrick from the ruins of Jericho dated to circa 6000 BC. He comments: "The men shaped, patted and moulded the clay for building-bricks, some of the earliest known. The marks of the brick-makers' thumbprints are still there."

The other photo, from the revised *Earth-wall construction* edition of 1981, shows Laurie Schneider's suggestion for lining a mudbrick mould with metal to give the block a rippled exterior face.

6000 BC



1981!

Cob does the job

By Bob Rich

Cob construction is a traditional technique for building earth walls that is rarely used nowadays.

Good quality clay was mixed with water and straw to form a stiff mix. This was laid directly onto the wall and allowed to dry before the next course was slapped on (one week or more, depending on the weather).

When the walls were up to the height required, they were trimmed flat and plumb with tools which were like a spade set at an angle to the handle. Holes were excavated for doors and windows and the internal faces of the walls were also trimmed.

The technique required very good quality clay, since serious cracks were quite likely with "mudbricks" the length of a wall. Trimming and the excavation of door and window openings were skilled tasks which the amateur was quite likely to spoil. Worst of all, from the professional builder's viewpoint, a week or more was necessary between courses. So, while the working time needed was much less than for mudbricks or rammed earth, the total elapsed time was a lot more.

Now, this last feature of the cob method is no disadvantage at all for someone building only during weekends and holidays. Even the full-time, single-handed owner builder will find plenty to do while waiting for the mud to dry at any one location on the wall. Overall, about 60% of the work on an earth-walled house is carpentry and, in any case, if all external and internal walls are to be of mud, it will take several days for one person to work his way around, doing one course for all the walls at once.

A relatively minor modification converts cob into the easiest, least labour-intensive means of building a wall that I know of. This is to clamp formwork onto the wall and pour in the mud. The idea is simple, but there are a number of further features which make the method workable and convenient and there are some options from which to choose.

It is important to point out that formwork cob is not in any way related to rammed earth. It uses clayey soil, which is puddled as for mudbricks. In fact, I make my mix so sloppy that I pour it into the forms by the bucketful. In contrast, rammed earth uses relatively sandy soil, shovelled in just damp, then rammed hard. The final appearance of formwork cob is also like that of a mudbrick wall, although a bit smoother.

Loadbearing v non-loadbearing

Formwork cob is easiest with a post-and-beam load-bearing structure. If the uprights have the same width as the thickness of the wall, they can be used to hold the forms in place. The same is true of door and window frames.

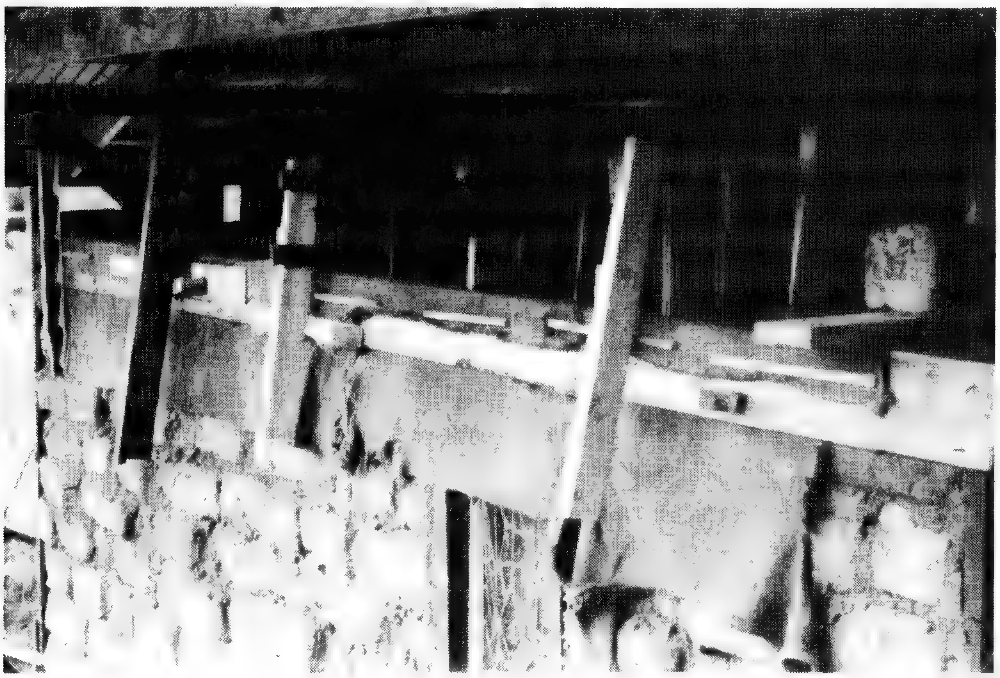
This makes the setting up of forms a quick and easy matter — they can be temporarily nailed to uprights and frames. Two further advantages are that you can put the roof on first and then work in all weathers; also the walls are automatically plump and straight.

Nevertheless, a loadbearing formwork cob wall is also possible. Corners have to be set up with mudbricks, as shown in Figure 1 (a). Note that you have to keep a proper bond, that is, vertical joints are staggered from course to course. The end of a form along a straight section can also be closed with a mudbrick laid to form a proper bond, or with a wooden divider — *Figures 1 (b)* and *(c)*. Door and window frames are still available for forms to be nailed to them.

Clamping the forms

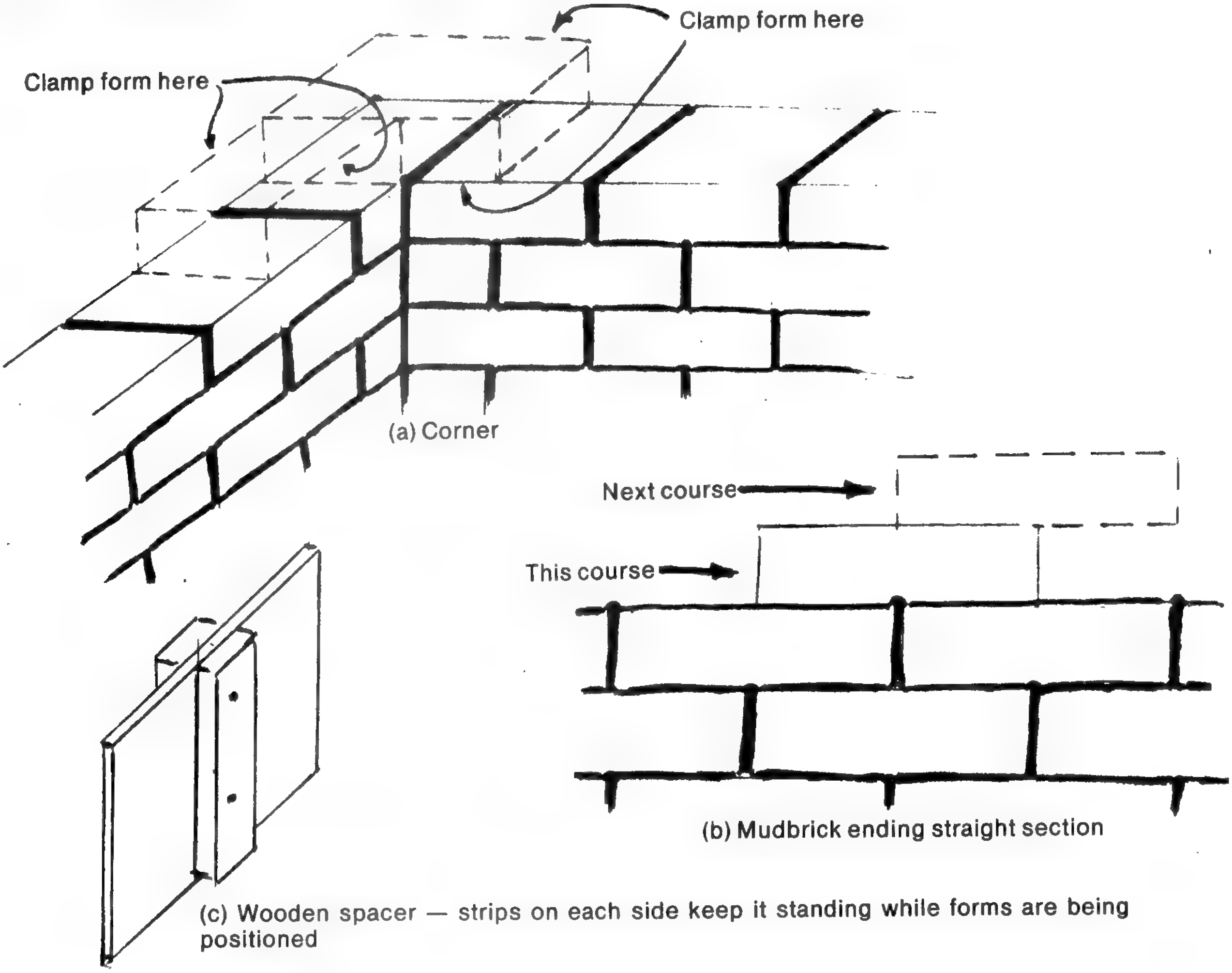
As I have mentioned, any wooden uprights can be used to nail forms into. In between, you should use clamps at about one metre intervals (assuming old floorboards as forms).

Shop-bought clamps are expensive, but you can



The photo shows nearly the whole course from outside, with floorboards used as formwork, scrap hessian nailed on and the row of wooden clamps. Photo by Mark Gunther.

Figure 1: Supports for form ends, load bearing walls

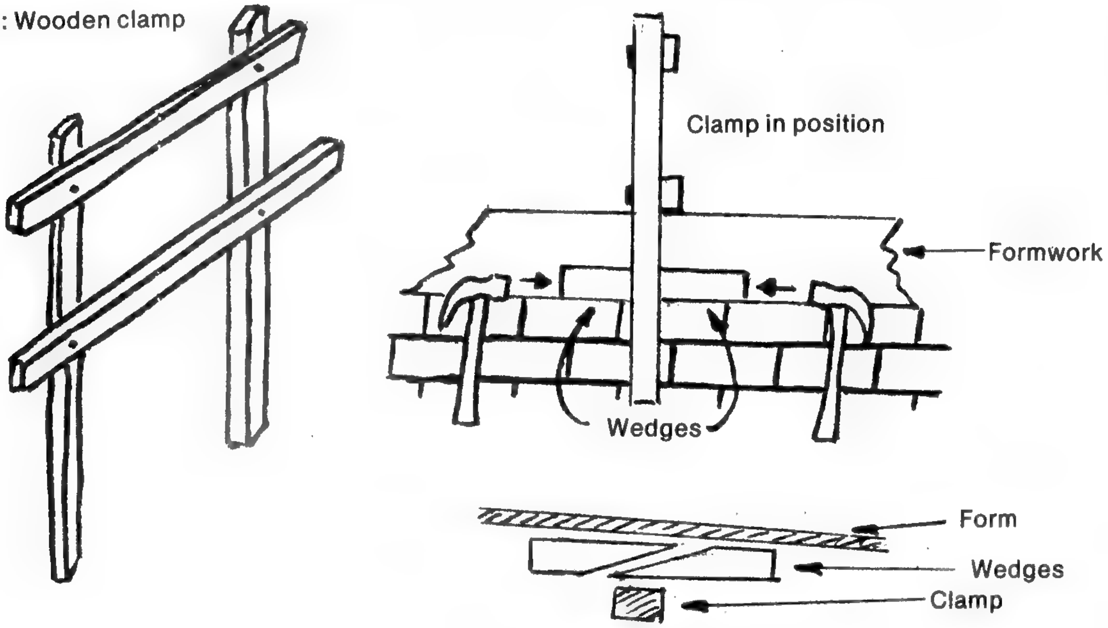


(a) Corner

(b) Mudbrick ending straight section

(c) Wooden spacer — strips on each side keep it standing while forms are being positioned

Figure 2: Wooden clamp



Cross section

make a wooden one *(Figure 2)* in about 10 minutes. It is a "double H", a crosspiece about halfway and a second crosspiece near the top. The four joints each have a single clenched-over nail. The lower crosspiece sits on the formboards.

The width between the uprights should be at least 40 mm more than that of the wall, plus the two forms. You just sit the clamp on the forms, then securely wedge between the form and upright on one side. I have used this device even with rammed earth, using a machine rammer, and it stands up to the vibration and force.

Cob places far less stress on forms and clamps. If there is a tendency for the clamping to push the top of the forms inwards, place a few of the wooden dividers mentioned below into position *before* the mud is poured.

Allowing for shrinkage

I avoid cracking by placing wooden dividers into the mud at regular intervals (say 300-400 mm). These are the same width as the thickness of the walls and are long enough to be grabbed when it is time to pull them out.

In effect they cut the wall into mudbricks made in position, but bonded to the previous course. Any shrinkage that occurs will concentrate at the dividers, reducing cracking to about zero, even with inferior soil. The position of the dividers is staggered from course to course, as in brickwork. The gaps left when they have been pulled out will be filled when the next course is laid — but you must prevent mud leaking out through them.

Mud stiffness

Mixing clay to water is easy work only as long as you have nothing thicker than a slurry. As the mud thickens, the difficulty of mixing increases out of all proportion. So if you want to be able to pull off the forms straight away without having too much slump, you have to pay in backache and puddling time.

The alternative is to invest a little time and money in a once only setting up spree: make enough forms, clamps and dividers to keep you going for at least two successive days without re-using a form. The work cycle involves removing the form from the previous course, setting it up, mixing the mud, pouring it in an putting in dividers.

Most wreckers sell "boxing boards" — floorboards only good enough for concrete formwork — very cheap, or you can get damaged boards, offcuts of fence palings or similar for nothing. In the long run, the more forms you have the easier the job.

Leapfrog v cob-mudbrick mix

The easiest way to do the job is to have two sets of forms on each section of wall. One pair of forms *(A in Figure 3)* was used for the previous course. The dividers have been pulled out, clamps removed, but the forms are left fixed in place at the ends. The second pair of forms *(B)* is placed on top of the first (saving a lot of fiddling) and fixed in place.

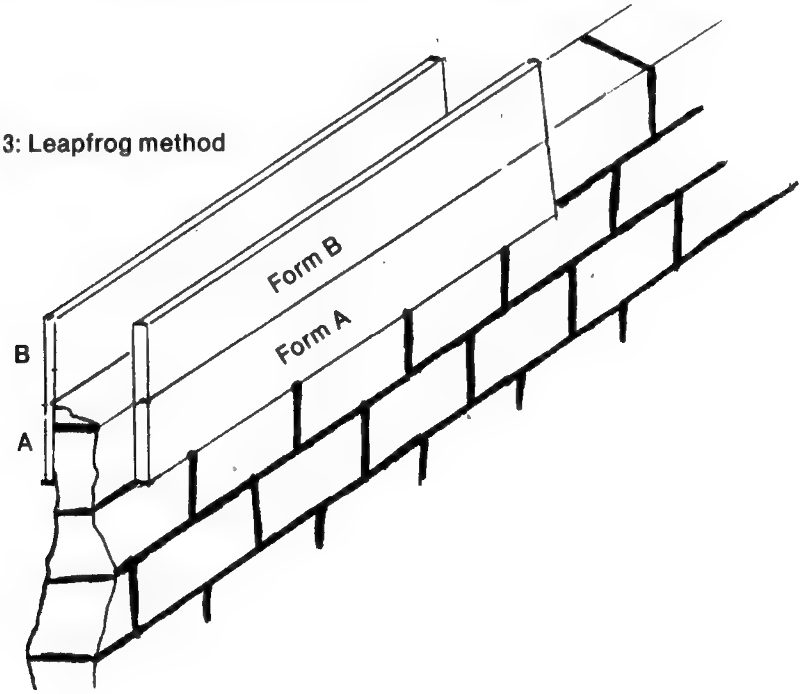
Clamps have to be long enough to reach the bottom of form A. On the next occasion, the A forms are removed and stood on top of the B forms, and so on.

You can reduce the drying time by several days and improve the appearance of the wall by alternating courses of mudbricks and cob. You lay a course of bricks and immediately set up forms on top of them and pour a second course. Not only do you have two courses laid at the same time, but also the dry bricks soak up a lot of the moisture from the mud above them.

Of course there are costs. Elapsed (wall drying) time is reduced, but making, turning, standing up, stacking, fetching and laying the bricks and mixing the mortar (a lot thicker than the cob slop) take extra time and effort.

To my eye the irregularities of the wall improve the appearance, but you have to smear thick mud along the bottom edges of the forms to eliminate annoying leaks of mud. The forms should overlap the previous course (of mudbricks) by about 25 mm. Therefore the height of a brick plus mortar under it should be the width of the formboard less 25 mm.

Figure 3: Leapfrog method



Reducing drying time

First of all, it's best to put up the roof before starting the walls. Otherwise, provide a temporary cover over freshly laid or poured mud walls (not plastic — let air circulate). Second, you can spend extra work by mixing mudbricks and cob as described already. But whether you do or not, a really big improvement can be achieved by soaking out excess water with hessian.

If you mix cob and laid bricks, you can nail hessian to the inside of each form.

With the leapfrog method, you need two bits of hessian for each side of each location. Start with only a little of one bit hanging below, the rest being folded over the top. As the forms leapfrog up, the hessian stays in position relative to the wall, until only a little of it is above the top form. At that stage, you introduce the second bit of hessian, with most of it folded over the top.

Using this method, I have poured successive courses on top of each other no more than three days apart! This was in cold, wet winter weather, but under a roof. However, I don't recommend such speed. The lower courses could collapse if too much weight is put on them before they are properly cured.

Summary

Let us assume that you have poured concrete footings and build a masonry wall at least 225 mm high and the thickness of your wall (leaving gaps for doorways, of course). You have ensured that there is an efficient dampcourse on top of, or incorporated within this because rising damp is fatal for earth walls.

You have made-up and erected door frames and loadbearing posts (if any). You are then ready to erect your earth walls, although you might well want to get on with your roof first. The equipment you'll need for building the walls will depend on whether you will use the brick-cob mix or the leapfrog method.

Equipment for brick-cob mix

First, you will need all the paraphenalia of mudbrick making, including space for drying and storing bricks. By the time you start on the walls, you should have built up a good quantity of bricks. Second, if you go along with all my reasoning, you will need forms for several sections. Each section needs two boards, of width 25 mm greater than the height of a course. Each will have a bit of hessian nailed to it. You will need a wooden clamp and a pair of wedges for each metre or so of each section and a divider for every 300 mm (or whatever your brick length).

Equipment for leapfrog method

It will still be useful to have a few mudbricks (for example, for T-junctions at the ends of internal walls), but a single mudbrick mould and a few day's work will do you. However, the length of boards needed for forms is doubled: each section requires four boards. This involves only a little extra work and the extra cost is minimal.

You need the same number of wooden clamps, wedges and dividers as for the other method, but the legs of the clamps need to be long enough to press on both forms at the same time. Finally, you need two pieces of hessian for each side of each section.

One other thing that owner builder needs is a willingness to learn from the experience of others where available and relevant, and imagination and the courage to experiment and learn from his own mistakes. You will find building your own house an enjoyable and challenging experience.

Mudbricks again

Many ways to mix mud

By Rob Thomson

I think Jim Harris may be astray when he says (in *Mudbrick sequels,* Earth Garden 31) that it is superstition to suppose straw is needed in mudbricks.

Certainly some soils/clays can be used without it and Europeans to whom I've spoken claim that straw, *as such*, is not needed. In some areas they use horse manure, for instance. Possibly it is something in the breakdown of organic material that helps. Jim Harris mentions tannin (you have a typographical error, "tanning" in the text) but Hassan Fathy's suggestion is lactic acid and other long chain organic molecules, which seems a better guess to me.

Fathy and a number of older Australians, speak of the need to let mud "mature" for some days (up to a week), when it becomes jelly-like and, I suppose, the necessary chemical processes are sufficiently advanced to give what is considered a good mudbrick (John J. Alderson mentions this in *Mudbricks yet again,* EG 10, page 27 — *Eds*). Others can make bricks as soon as the mud is mixed.

One thing is certain — there are no hard and fast rules for mudbricks, although there are many would-be authorities who try to make them. Marcia Southwick in her book *Build with Adobe*, starts by saying "If you are planning to build an adobe house in New York State, forget it!" Yet the testimony of old mudbrick dwellings in high rainfall areas laughs at her pontificating.

Alistair Knox had a mudbrick in his office when I visited him some time ago which had lain in a paddock in Warrigal (Victoria) for 35 years! It was barely eroded. Mudbrick compost bins at Montsalvat show little erosion after many years in Eltham's misty weather.

Another painful egotist who compiled a United Nations booklet on mudbricks stated emphatically that mudbricks were first made 2,500 years ago, but Hassan Fathy's *Architecture for the Poor* shows mudbrick vaults which have been standing for about 3,900 years! Why is it that the humble mudbrick causes some people to lose their humility?

Earth building is a fascinating and deep subject. There are so many ways of mixing mud, some better than others. Good advice for one situation is no good for another. Some methods yield better results than others, but as one looks around, it becomes clear that even rough handwork and poor design can still give a worthwhile dwelling.

Let each builder express himself as he wishes, the material has a greatness of heart which will overlook mortal imperfections to a large degree.

Peace, Rob Thomson, Thangool, Queensland.

Bob Rich says:

Jim Harris' comments on my article were very flattering and rather made my ears burn! He is claiming a lot more for my method than I do myself. For example, bricks made in the winter from very heavy, kaolin-rich clay take approximately forever to dry in any case, so it doesn't pay to put extra water in the mix. I have been playing with various attempts to solve this problem, with little success so far.

Bob Rich, Moora Moora Co-operative, Healesville, Victoria.

more land lines

GOAT LINE

I am interested in breeding coloured Angora goats. Anyone of same interest, please contact me. I have for sale one two-year-old proven buck and a one-year-old unproven buck. My 17 goats are used to being tethered and good husbandry.

Shirley Bennetts, Buttai, via East Maitland, NSW 2323.

Wanted 100-150 acres of fertile land in quiet area for planting fruit and nut trees, vegetables and crops. Part cleared, part good timber, permanent water, prefer south-east Queensland or north-east NSW up to 25-50km from the coast. Level area to build house, otherwise undulating country. Access to school bus, primary and high school and electricity. Would also be interested in shares with individual titles.

Please write: C. and E. Iseli, c/- PO Eudlo, Qld 4554.

About April-to-August 1982 we are leaving Darwin for the Cairns and Tablelands area, looking for our dream. We intend to travel slowly to break free of all city bounds along the way. If anyone would like help with their dream in the way of building (husband qualified), gardening, or odd jobs in return for caravan space, loo and fresh vegies, we would love to help. We would also be gaining extra experience. We are two adults, two children (10 and 8), two cats and one dog. We will be travelling via Townsville.

If you are interested, please write to Dennis and Sue Page, Box 40191, Casuarina, NT 5792.

We have recently bought some land near Kenilworth in south east Queensland and would like to hear from any people living about the region who have built in mudbrick and would be willing to share their experiences and expertise. We are moving north in about six months and trying to get our building plans in some sort of order.

Please write, Max and Trisha Richards, 35 Harold Street, Ascot Vale, Victoria 3032.

For sale at, or after the sale of our restaurant "Beggar's Banquet" (land lines, EG31, p 26), is our house, not far away, on a large block of land with good views of the town and the mountains. It is a renovated cottage, in general good order, with a large garden, chook run and room for a sheep or two. Price $22,000.

Lyn and Kim Henry, 7 Blake Street, Deloraine, Tasmania 7304.

We are starting a large, organised community on a beautiful property of 5700 acres in southern Queensland. There are mountain ranges and rainforest, leading down to sloping bush with tall gums and rocky outcrops. There is one main creek and a few tributaries, palms and ferns. We are selling 100 shares of approx 50 acres each for $5000. We are interested in people who wish to evolve spiritually and in harmony with the natural environment. Children's development has a high priority, so the establishment of a school would be one of the first things to concentrate on.

Write for further details to G. Heron, 61 Moorooduc Road, Moorooduc, Victoria 3933 (please enclose SAE).

We are seeking contact with an independent, sensitive mother with young children who is looking for a similar quiet and simple lifestyle as we are. We are in our mid 30s and have three young children, 7, 5 and 3½. We enjoy our children, the land, cooking, music, reading and seclusion. We are not religious, or on any campaigns. We will be purchasing a farm some time early next year.

If this sounds interesting to you, please write to Tony and Mary Henderson, PO Box 260, Blackburn, Victoria 3130.

My parents are interested in joining with other "Oldies" in a community-type situation with a view to purchasing acreage on a share basis in the north coast region of NSW. They are looking at an outlay per share of not more than $4000, less if possible. There is plenty of land available, providing you have sufficient money to purchase large holdings and there must surely be plenty of others like my parents who would like to leave city life and return to the scrub, but haven't the capital to buy land and put a dwelling on it.

They are non-drinkers (not wowsers) and non-smokers, interested in starting to do their own thing (a bit of gardening, fruit trees, run a house cow, etc) with others interested in a similar course of action. The only real stipulation to the lifestyle would be electricity and telephone as they are past the stage of "roughing it". They are in their mid-to-late 50's. They have some farming experience, enjoy fossicking, bushwalking, animals and birds and just want to live in the peace and quiet of the scrub.

Please write to Christine Speers, 176 Casino Street, South Lismore, NSW, 2480.

Rob, Linda and Joseph would like a part of, or accommodation on (in exchange for work) an outfit of 10 to 100 acres in the Cessnock, Tamworth, Coffs Harbour area. We would even like to run a P.O.-general store or eating and meeting place. Rob practises as a herbalist and is skilled in animal doctoring. He has farm experience, a heavy endorsed licence and farm machinery is no trouble. Pretty handy with a hammer too. Linda is a nurse who enjoys designing and making clothing, quilts and other handcrafts. Joseph was born at home and at 21 months is quite an advertisement for raising on a clean diet and common sense. We don't smoke or drink.

Regards Rob, Linda and Joseph Catton, 70 Guelph Street, Somerville, Victoria 3912.

Help wanted! 1. Architectural advice on repairs and autonomous renovations to 1930s weatherboard house. 2. Competent landscaping help in establishing windbreaks, pergolas, useful plants and a trickle irrigation system for minimum care 75 ft x 300 ft garden on a south coast cliff of NSW overlooking the sea. 3. Conservation and maximum use of rainwater, wind, etc. Small budget.

Penny Ferguson, Coalcliff, NSW. Phone: (042) 94 2423 after 6 pm on weekends, or write P.O. Box C54, Clarence Street, Sydney, NSW 2000.

The Yulunga Community Project places great importance on personal growth as well as the exploration of self-help therapy techniques based on Primal, encounter and Rajneesh meditation.

We (at present Eva, Rainer and two children) are looking for more committed "core group" members who are aware that nuclear family living, even on shared land, is not the answer, and we are motivated to confront their feelings and work on their hang-ups together in a loving environment. We have 150 acres, communal house and other building, frost free, mostly cleared land, permanent springs and creek frontage adjoining rainforest. Shares cost $3000. At present running regular growth workshops, planting fruit trees, interested in self-sufficiency through permaculture.

Eva & Rainer Taeni, Yulunga, PO Nimbin, NSW, 2480. Phone: (066) 89 7231.

Hope to meet people to form a land buying co-operative in northern NSW Vegetarians, who like lots of gardens, fruit, flowers, vegetables, fresh water, a cow to wander in the meadow and an independent life. You need some money of course. "Better late than never."

Write: K. Jones, 4/181C Edgecliffe Road, Woollahra (Sydney), NSW, 2025.

We are a young couple with two little girls, at the moment living near Campbelltown, 60km from Sydney! We want to sell our house but we have not had a chance to look around for land as it costs a lot to drive around. We are thinking of 10 or more acres and have around $15,000 cash. We would like land in Victoria: Gippsland or Australian Alps; NSW: around Goulburn, between Wauchope and Grafton and also around Mudgee.

Please help! Manfred & Mirjam Aigner, 20 Carrington Circuit, Leumeah, NSW, 2560.

We are a community of two families living on 175 acres, 7 miles north of Briagolong, East Gippsland. We are putting through a rural cluster subdivision and wish to sell a third share for $14,300. Our land is partly cleared and situated in a secluded valley. Our aim is to develop a quiet, peaceful, natural lifestyle, working together whilst maintaining individuality. We'd like to hear from anyone interested in sharing our land and lifestyle.

Anne & John Woollard, Rhonda Meynell & Chris Lawless, PO Briagalong, Victoria, 3860. Phone: (051) 45 5356.

I am still looking for a young trainee to share the Mary Andrews Memorial Garden (see *A hermit's garden,* EG29) with me. This is a chance for a young man who loves plants and nature to build a business, with no capital required. He must be willing to learn and work. I want to pass on my knowledge and share this unique garden project. Income is very small at the moment, but plenty of scope in the future.

Write for details to Bruce Andrews, PO Box 186, Mareeba, Qld 4880.

Shares for sale: Large acreage of forest-covered hills in central coastal Queensland needs more shareholders of the peace and nature-loving kind. Shares are $2000 for 11 private acres plus communal land. Tropical and temperate fruits, vegetables and herbs have done well, though potential has scarcely been tapped.

Looking forward to hearing from happy Earth Gardeners, Chris & Narelle Gordon, C/- Bourke High School, Bourke, NSW, 2840. Phone: (068) 72 2823.

Wanted: unfurnished house to rent in or around Rockhampton, to $60.00 week. Must have fence to keep in 2½-year-old child. Would like reasonable backyard for garden. We are a young couple, with young daughter and mature house-trained cat. I'm having trouble getting what we want through conventional sources.

If anyone can help, please write to Gail Godwin, 2/32 Lucas Street, North Rockhampton, Qld 4701.

For sale: small farm, would suit organic growers; never been supered, large dam would suit fish, prepared house site with suitable soil for mudbricks, access road, 5000 gallon concrete tank, 36 inches rainfall. North-facing slopes, backs onto Mt Samaria State Park. Survey work for 16 ha subdivision completed by the owner; 20 minutes to Benalla.

Urgent sale, contact Ken Young, PO Box 510, Benalla, Victoria 3672. Phone: (057) 62 4384.

We are a 35-ish couple with two children (f and m, nearly 12 and 10 respectively). We've bought a quarter share in about 170 acres of beautiful land near Walpole, Western Australia. A second share is owned by a hard-working, capable single guy of similar age. Like us, he is at present in Perth, working to pay off his lot. The other two shares are for sale (on a non-profit basis). Our main priority is to have people with children (preferably aged 10-12 years!) Cost of a share would be around $13,000, with electricity available (if you want it) for a further $200 odd. We would be glad to send more details to anybody interested, with a copy of our "rules of conduct", which is legally binding on all shareholders.

Yarra and Luda Korczynskyi, 12 Stuart Street, Maylands, WA 6051. (From December, 1981: C/- PO Walpole, WA 6398.)

Julie and I are looking for a little farm (up to $50,000) in the Taree / Wingham / Gloucester area of NSW. It would be nice to meet some Earth Garden readers who have made the break and know more about the place than we do. We have two children, Danny (10) and Katherine (8). We would like to join or if necessary establish a group interested in folk music and dancing.

If anyone would like to contact us we would arrange to come and have a chat.

Sincerely, Alex & Julie Bishop, 27 Franklin Road, Cronulla, NSW, 2230. Phone: (02) 523 6323.

Community shares available: We have found approximately 150 acres in the Nimbin area and have taken the initial steps towards its purchase. The cost of the land is $70,000 which we have divided into 8 shares of $10,000 each (to cover setting-up costs). We need four more shareholders. The land has a 1.9km frontage onto a large permanent creek with plenty of swimming holes. Wide variety of soils, varied topography. Each shareholder will have about three acres for private use, the remainder to be used and enjoyed communally.

Please contact: Tony Gibson, 17 The Boulevarde, Lilyfield, NSW, 2040. Phone: (02) 82 0157, or Mario Russo, 3/69 Magellan Street, Lismore, NSW, 2480.

Exchange, with cash adjustment (our way): 3 bedroom home (built-ins all three), 4½ years old, dining-lounge combined, gas heater, screened aluminium windows, large kitchen, laundry, bathroom, septic toilet, chook pen, garden, concrete paths (no work needed), close to shops. Suit family wishing to be a bit more self-sufficient and have their own eggs and vegies, but not wanting to be isolated. *For* acres (must have water) with house, cabin, building, etc. Any area considered, all letters answered.

Please write, giving your details to B. Cosgrove, 148 Mustang Drive, Sanctuary Point, via Nowra, NSW 2540.

We are reluctantly selling our older-style house on two large blocks. One room is at present used as a non-official Post Office, bringing in part income. Chooks, ducks, five pet ewes and one ram are included in the sale. Situated approx 15 miles from the Flinders Ranges in the mid-north of South Australia in a farming area. Mains (bore) water, huge underground water storage and other rainwater tanks, fowl sheds, etc. School bus passes close by. Price $10,000 ono.

Please write: Ruth and Glen Cunningham, PO Willowie, SA 5486.

We are two friends who wish to sell our 20 acre block of land at Millmerran, near Toowoomba. Power and phone nearby and a school bus runs past on a good sealed road, 15 minutes to Millmerran. Soil is typical black belt sandy loam. Two hours to Brisbane. No clearing has been done and several varieties of pine are flourishing. Price $14,000, negotiable.

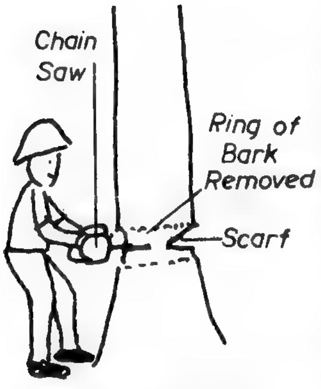
Paul and Warren, C/- P. A. Wyss, PO Amamoor, via Gympie, Qld 4570. Phone (071) 84 6208.

Due to chemical poisoning from local farmers and two Shire Councils who insist on spraying thousands of gallons of "harmless" 2-4-D and 2-4-5,T in the area we have been forced to sell our home and 20 acres of land. We refuse to jeopardise our children and our own health by staying in that area. We are now looking to buy shares in a land co-operative somewhere in a chemical-free area.

I am 34, my wife 31 and we have a son, 5 and daughter, 3½. I'm a mechanical fitter with experience in pump, turbine, engines and anything else I can lay my hands on. We've raised all sorts of animals and have learned a lot from our past 4½ years on the land. We'd like to hear from any co-ops or like-minded people, especially in the Albany to Perth, WA area. We started our quest in October, searching for our new home and new friends.

Love & peace, Howard, Marilyn, Casey & Sasheene King, C/- 170 Glenholm Street, Mitchelton, Qld, 4053.

FORESTRY DIRECTORY



TREE FELLING

Yes, the forestry people have more than a slight bias towards planting exotic pines (more timber than eucalypts, you see). But their services are good and on tap for all State citizens. Use them then, to shop for native tree seeds and seedlings and for information leaflets on trees, planting and caring for them, reforestation, windbreaks, bushfires, wood preservation and timber building.

New South Wales

Forestry Commission of NSW, GPO Box 2667, Sydney 2001, (95-99 York Street, Sydney 2000).

Nurseries

Forestry Commission of NSW nurseries are at Pennant Hills (Sydney), Muswellbrook, Narrandera, Forbes and Dubbo. They stock a big range of native and exotic seedlings. Ask for the free leaflet *Buying a Tree* for full details. Prices start at around $1.20 for each seedling, with discounts for large quantities. Trees are sent by rail (freight charges extra).

Publications

A wide range of excellent leaflets are available, many free, and some books. Ask for a *General Publications List* which gives details of prices and postal charges.

Some of these leaflets are excellent, for example Education Sheet 1, *The Eucalypts,* ES-2 *Rainforest* and ES7 — *Trees of the Sydney Area.* If you are buying trees, you would need Extension Information leaflet 2 *The planting and care of tree seedlings* and X-1 *Trees for farm planting,* plus the *Nursery Species List.*

Buying seedling trees requires a lot more care than selecting pot plants. The 30 cm seedling you choose for that corner spot could, over a period of 30 to 40 years, grow into a 30 m giant that dwarfs house and garden.

Tasmania

Forestry Commission, Tasmania, Forest Nursery, Perth, Tasmania 7300.

The Perth nursery has tree stock which includes radiata pine, hedge plants and regular stock (Australian natives), also advanced trees. Write for a price and stock list.

Tasmanian Timber Trees, Janet Sommerville, Education Dept of Tasmania, 1981, is available at $2.00, also various leaflets and bulletins are free, including notes on species such as Leatherwood, Huon Pine, King Billy Pine, Gum Top Stringybark, etc.

Queensland

Department of Forestry, GPO Box 944, Brisbane, Qld 4001, (Mineral House, 41 George Street, Brisbane).

Nurseries

Amenity nurseries are at Salisbury in Brisbane, at the Bunya State Forest Park and at Dalby. Trees will also be sent by rail freight, packed in moisture retaining cartons. Interstate shipments may be made from the Salisbury nursery which will provide a treatment certificate (extra charge $1.00).

A list of tree seeds and prices is available on request. A full list of available tree seedlings, with brief notes on each, is given in the booklet, *Trees and Shrubs.*

Distinctive trees native to Queensland include western white cypress *(Callitris columellaris* syn *glauca),* Bribie Island pine *(C. columellaris),* hoop pine *(Araucaria cunninghamii)* and the Bunya pine *(A. bidwillii)* which has edible nuts.

Publications

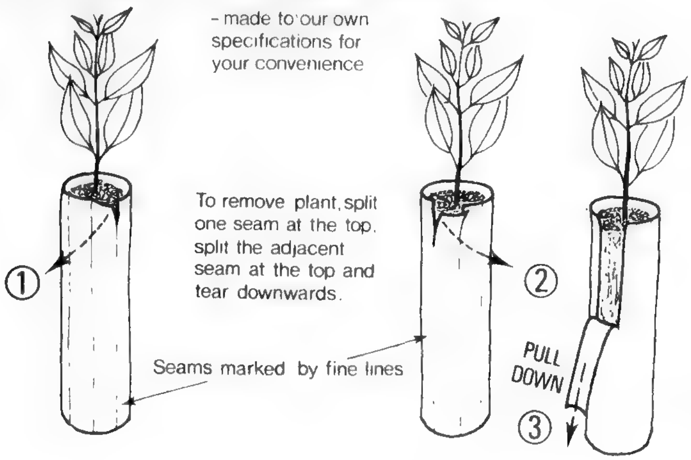
Many technical bulletins and research papers are available as well as more general Information Sheets and Tree Advice leaflets, which are free. Useful leaflets include IS5 *Your home and bushfires,* IS6 *State Forests and honey,* IS8 *Mammals of North Queensland* and IS nos 10, 11, 12 and 13 which cover respectively the history, geography, wildlife and forestry of Fraser Island.

Trees & Shrubs for Eastern Australia

Forestry Commission of NSW, NSW University Press, Sydney, 1980, paperback, 165 pages, plus colour plates.

This book has been used constantly while we were compiling our *Trees* issue. It contains keys with cross-references of common and botanical (Latin) names of 500 Australian native and foreign trees, summarising their characteristics and giving a brief description of each tree's common name, natural area, flowers and bark, uses and height at maturity.

Price $4.95 in bookshops or over the counter at Forestry Commission of NSW or $6.00 posted in Australia from the Commission.



REMOVAL OF PLANTS FROM TUBES

NEW, CONVENIENT TO OPEN, THICKER TUBES

- made to our own specifications for your convenience
To remove plant, split one seam at the top, split the adjacent seam at the top and tear downwards.
①
②
PULL DOWN
③
Seams marked by fine lines

South Australia

Woods & Forests Department, GPO Box 1604, GPO Adelaide, SA 5001.

Nurseries

Self service nurseries operate at Berri, Murray Bridge, Belair and Cavan. Catalogue plants may be ordered by mail from the *Catalogue of Nursery Stock,* price $1.20 posted, which contains lists of plants for swampy and salty sites, woodlots, shade, fodder, erosion control, attracting native birds, coastal gardens, etc.

Mail orders for plants, packed in polytubes and polybags, should be sent to Belair Nursery, PO Box 1, Belair, SA 5052.

Publications

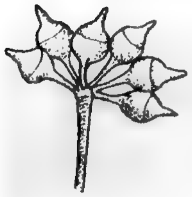
A series of free Horticultural Leaflets is available, dealing with lists of species suitable for varied rainfall areas and for saline sites — salt toxicity is a big problem in South Australia. There is an outstanding leaflet *Planning a Native Garden,* on designing your own native house surround landscape, also *Low maintenance gardens* and one on Brown Boronia *(Boronia megastigma),* the sweet scented boronia which thrives as a pot plant.

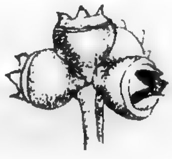
These Bulletins are available from the Department by mail:

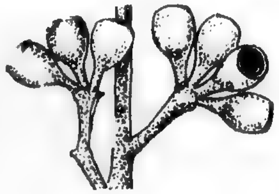
Tree Planting Guide for South Australia, C. D. Boomsma, 180 pages, colour illustrations (Bulletin 12). Price $4.00, plus postage (weight 310 g).

Native Trees of South Australia, C. D. Boomsma, 288 pages, with black and white photos and line drawings for every species. (Bulletin 19.) Price $9.00 plus postage (740 g).

The Native Forest and Woodland Vegetation of South Australia, N. D. Lewis & C. D. Boomsma, 313 pages, colour illustrations, with large fold-out map of SA vegetation formation (Bulletin 25). Price $9.00 plus postage (645 g).







Victoria

Forests Commission Victoria, PO Box 4018, GPO Melbourne, Victoria 3001 (601 Bourke Street, Melbourne).

Nurseries

Over 400 different species of trees are raised at the Forests Commission nurseries at Creswick and Macedon, which supply the medium to high rainfall areas and at Wail and Mildura, which specialise in the Wimmera, Mallee and north of the State. There are separate *Forest Tree Nursery* booklets for the two areas, listing details of each tree. Tree seedlings are not supplied to the metropolitan area.

Publications

A range of leaflets, technical and information sheets are mostly free. The information is all there, but it is not as vividly presented as in the other States. Exceptions to this are *The Design of Windbreaks* (Forestry extension booklet) and IS6 *Tall Trees,* which talks about the mountain ash *(E. regnans)* forests

E. marginata (Jarrah)

Western Australia

Forest Department of WA, 50 Hayman Road, Como West, WA 6152.

Nurseries

Forests Deprtment nurseries are at Hamel and Narrogin. Trees are not supplied to people living in the metropolitan area. Mail orders go to the Forrester-in-Charge, Forests Department Nursery, Narrogin or Hamel.

Publications

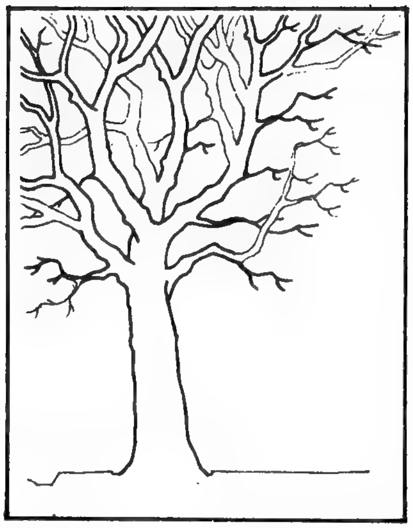
Useful research papers, information sheets and bulletins, mostly free, are listed in *Current Publications* (Information Sheet No 38). Notable among these are IS6 *Eucalypts: A Simplified Key to 17 WA Species,* IS12 *Birds of WA Forests,* IS28 *The establishment of plants by the seaside,* IS30 *Honey production* and IS33 *Protecting trees during home construction.*

The leaflet *Trees for Agricultural Areas of WA* has details of species available for farm planting from the nurseries.

Planning your garden to conserve water is a booklet with information on establishing a native garden, while *Western Australia's Wonderful Timbers* sums up the trees unique to the West, including marri *(E. calophylla),* karri *(E. diversicolor),* wandoo *(E. wandoo),* tuart *(E. gomphocephala)* and jarrah *(E. marginata)* with photos of the trees and drawings of their fruits.

Forest Focus magazine, issued quarterly, usually has about 28 pages and uses colour photos to show unique features of Western Australia's beautiful bush and animals such as the numbat, tammar wallaby, quokka and the rare woylie, a tiny rat tailed kangaroo, which are all facing extinction.

Death in the bush



By Charles Massy

Eucalypt dieback is a problem that is potentially one of the biggest natural, aesthetic and economic disasters to strike rural Australia and especially the tablelands in Eastern Australia.

In fact the traditional rural image of Australia of scattered gum trees and the odd wooded area in paddocks may soon be a thing of the past. But dieback is an issue in which *Earth Garden* readers could play an important role.

The Problem

Two types of eucalypt dieback should be differentiated, the one I am concerned about here in the rural areas, especially of Eastern Australia, which is caused by a complex of factors, and that caused by the root-rot fungus *Phytophthora cinnamomi.*

The root-rot fungus, now causing dieback in every State in Australia, has an effect similar to drought damage because the destruction of the small absorbing roots leads to the tree's inability to absorb water and nutrients. The CSIRO claims that this dieback in the Jarrah *(E. marginata)* forests of Western Australia has already ravaged 420,000 acres. The Australian Conservation Foundation (ACF) says 9600 acres of Jarrah are being flattened each year nearly as efficiently as a bulldozer by the fungus ... "the worst plant epidemic in recorded history."

The other form of dieback, that mainly caused by insect damage, is extensive in the three tablelands of NSW, the south east of South Australia and southern Queensland and much of Victoria. *In the New England plainlands almost all trees in 8000 square km are dead, for example, from Tenterfield to Armidale 8,400,000 acres are dead.*

The symptoms of this eucalypt dieback are the gradual loss of leaves, cessation of growth, death of limbs and the occurrence of peeling bark, leading to the eventual death of the whole tree.

New England seems to have been the first and worst affected. Where I live on the Monaro of southern NSW the problem has only been evident in the last few years, though it is now escalating alarmingly. Thus it is vitally important that we learn from the New England example — both disasters and recent positive moves — because the rest of us in similar areas may only have 10-to-15 years (perhaps less) to do something before we also end up with a landscape of skeleton trees, scarce fauna, increased erosion and potential salination (as has occurred in Victoria).

Now, many EG readers own or hope to own rural land. What's more, much of this land has trees on it because in traditional rural terms that land is not regarded as "economic" or as "good" for instance as is cleared, cropping land. Importantly also, this "alternative lifestyle" or "quality of life" approach person is more sympathetic to trees and their values and to conservation issues than the more traditional type of farmer.

For these reasons, such people can play a crucial role in combating dieback, maintaining gene pools, diversity, and the remnants of the natural flora for migratory birds, local faunal populations and also for the future seed sources if and when the pendulum swings and dieback runs its course.

To see what role we landholders can play I think a first step is to try to understand the cause of eucalypt dieback, bearing in mind that no one yet fully understands the picture.

Causes of dieback

It is not possible to pinpoint a *single* cause. The problem is a complex ecological one and many factors are involved, although man's interference in the natural system seems to have tipped the balance.

(1) Old age. This means that if the trees don't die a natural death they are more susceptible to the attack of pathogens/predators. The average age of gums is 150 to 300 years. In the intensively grazed areas of the Monaro there has been virtually nil regeneration of gums in the 140 years of grazing. The implications are obvious.

(2) Insects. These are one of the main factors. Phasmids, termites, grasshoppers, yellow longicorn beetles, scarab (Christmas) beetles and Chrysomelids all attack the leaves of gums. Others attack the trees elsewhere.

The defoliators cause trouble because constant defoliation exhausts the tree's food reserves and this leads to death. The process of insect attack on the Tablelands is: — scarabs eat the leaves, which leads to the growth of new or secondary shoots; these shoots are the favourite food of the Chrysomelids and so we have a synergistic effect. Chrysomelids can have three-to-four generations in a spring-autumn cycle, so they can build up quickly. On top of this in higher areas frost kills the new secondary growth.

There is evidence now that stress on trees (eg drought) leads to a change in composition of oils in the leaves which makes them even more palatable to the insects.

(3) Man's agricultural activity leads to increased insect attacks. Clearing leads to more insects for fewer trees; introduced pastures lead to an ideal habitat for scarabs with the result that there is a huge increase in population and fertilisers seem to make eucalypts more palatable to insects.

The thinning of woodlots has meant that the remaning trees are more exposed. Scarabs (Christmas beetles) don't like shade, so any clearing or thinning is to their advantage and the disadvantage of the tree population.

(4) Man's agricultural activity has other effects: — there is no regeneration because of grazing and cultivation. As well, improved pastures mean increased stocking rates which, with supering, has led to a redistribution of plant nutrients by stock camping under trees. As well as regeneration, there are increased death rates, for example in New England the rate went from 5 per acre in 1941-50 to 60 trees per acre in 1951-60.

The replacement of native pastures by exotics and the clearing of the important middle storey (eg blackthorn and wattles) has led to the reduction or elimination of plant species that served as food sources for parasitic wasps and other insects attacking leaf-eaters.

Dieback has increased in New England since the 1950s when improved pasture came. As well as the causes outlined previously, supering has meant there is more grass-growing right up to the trees. This provides ideal sites for leaf-eating insects to pupate. It also means that the decomposition of litter from the tree is interfered with, depriving the tree of nutrients and altering the normal nutrient cycling system.

A further effect of supering is that there has been an increase in phosphate and nitrogen in the soil, which makes life more easy for insects in the soil. Another possibility is that the soil may now be too rich for some eucalypts, which would weaken them.

Clearing has led to even-aged stands which are more susceptible to any outside adverse influences. Trampling and grazing have led to shorter grass and harder soil. This means rainfall is not impeded and thus there is less absorption. Soil consolidation hinders growth of roots and favours shallow-rooted trees which are more susceptible to drought and the effects of dieback. Soil consolidation also leads to poor soil aeration and therefore water-logging, which leads to erosion.

Effects of dieback

Economic. The solution to dieback rests essentially with land-holders in view of current government apathy to the problem. It is important therefore that the adverse economic effects be spelt out so farmers understand the implications of dieback in the area that interests them most.

Livestock productivity is reduced because of: reduced shelter from the cold, especially with lambing losses and off-shears stress; reduced shade and resulting heat stress due to reduced pasture growth because there is increased rapid moisture evaporation from increased wind.

Timber for fencing, farm construction and fuel is lost — although in many areas the future importance of fuel from farm woodlots is not yet fully appreciated. The honey industry is adversely affected, as well as eucalyptus oil, tannins and other side industries. A reduced bee population leads to inferior setting of other crops.

There is increased soil erosion and therefore increased costs in maintaining arable land. And in Victoria, South Australia and Western Australia millions of acres have become wasteland due to salination. In every case this salting was due to over-clearing of trees. Almost certainly the effects of dieback after a few years will be the same in some other areas.

What will happen to the tourist industry when the gums are gone?

Effects on wildlife

The habitat of flora and fauna is lost. This leads to a loss of animal diversity which, as a prime sin against the ecology of any system, means that system is more susceptible to adverse interference.

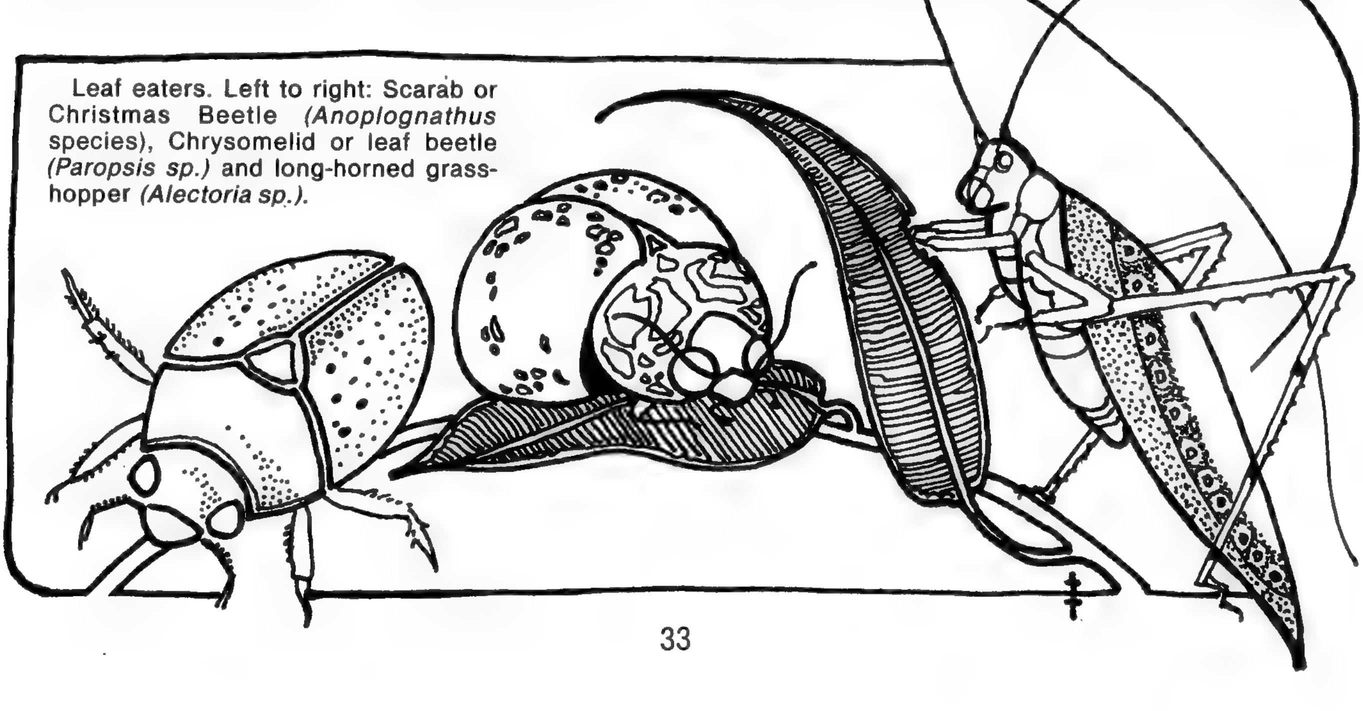
In Armidale for example there are huge flocks of magpies with no trees in which to nest. In the old days flocks of 1000 ibis were common but now, with no trees near water in which they need to roost, there are very few. Both birds are crucial in controlling the insects which are the main cause of dieback.

The CSIRO has warned that a rural Australia without native trees as habitat for birds may be overrun by pasture-eating insects. As well, other predators and parasites involved in other levels of biological control will lose their habitat too.

Options for action

From the causes and effects spelt out here a number of positive steps emerge for landholders and then for concerned citizens on a local/regional level.

(1) The old-age syndrome and even the aged stand situation has to be broken. Before the last trees go,



Leaf eaters. Left to right: Scarab or Christmas Beetle *(Anoplognathus* species), Chrysomelid or leaf beetle *(Paropsis sp.)* and long-horned grass-hopper *(Alectoria sp.)*.

taking their irreplaceable locally adapted genetic information with them, regeneration (the easiest and cheapest method of establishing trees) has to occur, or else seed collecting and planting.

(2) The superphosphate dependency syndrome (which helps to create the ideal habitat for defoliating insect larvae) has to be re-examined. There are farmers achieving high productivity and stable agriculture without super, *viz* Keyline and Wallace tillage methods.

(3) The advantages of native pastures also need to be re-examined. For example, they have proved to be saviours on the Monaro in the recent drought.

(4) Heavy stocking versus light stocking. Many farmers, including myself, have found light stocking just as, if not more economic than the more traditional heavier stocking rates.

(5) Tree-clearing has to stop or be restricted as must thinning (remembering that some insects don't like shade). Surely this potential disaster is enough to convince us we are out of the pioneering era?

(6) In view of the information on shade effects, but especially on insect predators and their food sources, the size, shape, location and composition of tree breaks/regeneration areas need careful consideration.

Example 1: As some predatory insects (eg wasps feeding on blackthorn, *Bursaria spinosa)* can only travel a half kilometre or so from their food source, such trees should be planted within ½km reach of the pasture.

Example 2: How about planting/regenerating large blocks or chunks of land instead of the traditional narrow and unnatural tree-break? In these areas go the most resistant species to insects; food sources for predatory insects; shelter species for livestock, or food species; other multiple resource trees such as bee and bird fodder and coppicing-type firewood species, etc.

(7) There is some evidence that by varying stocking rates from high to low on the same paddocks yearly or bi-yearly, then this adversely affects the populations of pasture scarabs, etc, and hence later the eucalypt defoliators.

The message from all this for anybody not yet in the dieback areas is to hang on to your trees! But for those in the danger zone, or who will be there soon, positive action must be taken besides mere retention, that is regeneration, planting and pasture manipulation.

What you can do

The big problem at the moment is information. Most farmers and the public in general — (1) Aren't aware of the problem of dieback or its causes; (2) aren't aware of the effects, especially the economic effects; (3) because of these previous factors, many simply don't care; (4) and most importantly, if they did care, they wouldn't know how to rectify it.

A national move to combat this information gap was begun in November, 1980, at the national conference *Focus on Farm Trees.* An Australian Farm Tree Regeneration (AFTR) Committee was formed (made up of farmers). But what is needed now is the establishment and linking up of active organisations on a regional level to publicise dieback and its effects and the methods of fighting it.

The role of such an organisation could be:—

(1) Through articles in local papers, seminars and field days, the dissemination of information on dieback, especially the economic effects. Most farmers won't listen to lectures or arguments on a purely philosophical level, so I think it is more effective to work through the hip pocket and illustrate the economic advantages of trees, with field days to show the techniques and their results.

(2) The co-ordination of government, local government, farmer and citizen groups in fighting the problem. On the Monaro for example the "Monaro tree decline working committee" has just been formed with representatives of farmers, private and State forestry, Soil Conservation, Department of Agriculture and local government — all able to contribute in their own fields.

(3) Initiate or become involved in regional/shire planning.

(4) Start school tree plantings and educational programmes.

(5) Start planting/regeneration of valuable unused land, or their incorporation in planning schemes, eg of Pastures Protection Board reserves, public roadsides and old railway lines.

(6) Initiate the collection and raising of plant seed that is adapted to the local area. The infant Monaro committee has already persuaded private and perhaps State Forestry to raise our seed. This will be the first time local farmers or interested people will have access to frost-hardened, local species and at reduced cost.

(7) Lobby politicians for schemes to encourage regeneration/planting, farm woodlots and so on, such schemes exist in South Australia and Victoria.

(8) Attract research or experimental trials into the local region on dieback, resistant species and techniques.

The New England Growback Committee is probably the oldest such group. *Warning:* Be prepared for disillusion with petty local politicians, apathy and the radical elements, who only succeed in alienating the common landholders.

Conclusion

Private landholders own or control 65% of all land in Australia. In view of government apathy and the acceleration of dieback in Australia, if we want to preserve the rural gum trees and the essential nature of the Australian landscape then we, the landholders, have to get off our bums. How about it?

Natural Resources Conservation League

593 Springvale Road, Springvale, Victoria 3171 (PO Box 105) supplies trees to farmers, schools, councils and other groups.

Trees and Victorian Resources, their quarterly magazine, is $1.50 per copy. The September 1981 issue featured foresters at work.

Australian Farm Tree Regeneration Committee

C/- PO Box 105, Springvale, Victoria 3171.

The AFTR Committee was formed by a group of farmers to encourage Australian farmers to regenerate native vegetation on their properties. Its aim is "to promote trees and associated habitat as a basic part of the management plan for every Australian farm, station or grazing lease."

Mr Tim Cox, chairman of AFTR, invites farmers or other interested people or groups to contact AFTR, which will support the formation of local/expert groups in farm tree planting and planning.

Renewing the land

This five-year-old rehabilitated mined area contains Eucalyptus and Acacia species.

The mining takes away the bush and Dieter Hinz is in charge of putting it back. The Yirrkala people, who live 10km from Nhulunbuy, revere the stringybark *(Eucalyptus tetrodonta)* and have given Dieter the name *Wanambi* — "Man of the Trees".

By Dieter Hinz,

I am an ecologist and have for the last 20 years been studying and working in the Northern Territory. As in so many parts of Australia, the flora and fauna in the outback here is absolutely fascinating.

You can understand how excited I was when I was given the opportunity to take part in the birth of a new town. Nhulunbuy is now the third largest town in the Northern Territory, with a population of 4300 people. It is situated on the Gove Peninsula in the far north-east corner of Arnhem Land on the coast of the Arafura Sea.

During construction I built a nursery to propagate the trees and shrubs needed to landscape the new town of Nhulunbuy. I propagated and grew a substantial cross-section of Australian and exotic plants and spent considerable time studying and trying to grow indigenous plant species.

I also trained Aborigines in nursery and landscaping techniques. After some time, when an understanding and trust was established between myself and the trainess, I was to learn of the importance the Aboriginal places not only on individual plants, which are edible or used as a medicinal remedy, but on the whole ecosystem, which has been part of their spiritual life and well-being for thousands of years.

After three years or hard work we had completed the town landscaping and it looked as if I could relax a little and take things more easily. But it was not to be: there was a new challenge awaiting me just 10 kilometres from town. Mining and bauxite ore was on its way and the mining land had to be rehabilitated and restored.

The NT soil conservation unit of the Department of Parks and Wildlife recommended certain soil erosion control methods and the local Aboriginal land owners wanted the land returned to its original state of open Eucalyptus forest.

The most dominant tree of the forest is *Eucalyptus tetrodonta,* the stringybark (called *karaigar* by the local Aborigines), followed by *Eucalyptus miniata,* the woollybut. The common understorey species are *Acacia leptocarpa,* the palm *Livistona humilis,* the "Screw pine" *Pandanus spiralis, E. foetscheana, E. policarpa, E. grandiflora,* Grevilleas, Planchonia and Caltyrix, naming only a few.

With a handful of Aboriginals at first I took on the task of restoring up to 100 hectares of mined land a year to a self-sustaining maintenance-free ecosystem.

I don't think that eight years ago, when I started, my criticis would have believed that it was possible to return an ecosystem of both flora and fauna so quickly. There is no secret about it, just observing, understanding and implementing nature. This means, for one thing, keeping the soil alive, a task of the utmost importance if man wants to succeed in managing the land.

Dieter Hinz in three-year-old rehabilitated area after direct seeding of native species. Left to right: *Acacia leptocarpa, Euc. tetrodonta* and *Grevillea pteridifolia.*

This is how it is done. The mining of bauxite and the removal of overburden soil are straight-forward open-cut operations. The surface vegetation, which is of no commercial value, is felled, pushed into heaps and burnt.

Scrapers then strip and shift the overburden onto the adjacent mine floor, the surface of which has been lowered some 3-4 metres by the removal of bauxite. To break up the compacted mine floor all mined areas are ripped through the overburden, promoting aeration and allowing for future root penetration.

The living topsoil, a layer of only 7cm, is stripped with scrapers from an adjacent cleared area and placed on the ripped overburden, which is approximately one metre deep. The harvesting of topsoil which contains seeds plays a vital part in the regrowth of the indigenous grass and ground cover species.

With good soil management a 40 per cent regrowth of the native ground cover community can be obtained in the first year followed by a steady increase of plants in each following wet season (Hinz 1979).

Field studies subsequently confirmed that most tree species do not return with the freshly spread topsoil. This is partly due to species producing seed on a biennial or triennial basis. Seeds are also part of the food chain to the fauna community of the Eucalyptus forest. Severe dry season conditions and frequent wildfires also account for high losses of seed (Hinz 1980).

Each season the flowering and maturing of seeds in the Eucalyptus forests are closely observed. Aboriginal women and men are part of the reafforestation team collecting sufficient quantities of seeds each harvest time. Some of these seeds are stored to ensure that an annual supply of seed is on hand.

With the onset of the wet season each year a mixture of native seeds containing a number of species of Eucalyptus, Acacias, Brachychiton, Alphitonia, Livistona, Grevilleas, etc, are broadcast and scarified into the surface of the topsoil using a tractor with a chisel plough.

I would like to point out that the restoring of mined land is done by direct seeding — no nursery stock is required.

Eucalypts measuring up to six metres in height are competing with the Acacia, Grevillea and Brachychiton species for the canopy layer. Edible food plants, which are part of the Aboriginal diet and the fauna population of the forest, have returned.

Believe me, it is rewarding to see the Aboriginal people cast their eyes with great satisfaction over their restored land.

COPPICING

There is not a more noble and worthy *Husbandry,* than is this, which rejects no sort of *Ground* nor *Situation.*
JOHN EVELYN, Sylva, 1664.

* * *

Turpentine *(Syncarpia glomulifera)*... coppices freely and stands cutting-back well, and will form a trim, dense hedge or small break which is very long lived. It is frequently left standing during clearing operations for shelter purposes, and is worthy of planting, being easily propagated from seeds.
R. H. ANDERSON, *The Trees of NSW,* 1967.

* * *

The coppice stand (at Black Mountain, ACT) looks very much better than the original forest and is producing a mean annual increment of firewood and small poles of about 25 cubic feet per acre per year, whereas net growth in the old stand was zero.
ALAN BROWN & NORMAN HALL, *Growing Trees on Australian Farms,* 1968.

Coppicing is an energy-efficient method of "farming" trees to provide a constant supply of firewood and timber from the same woodlot every six-to-eight years.

It is a straightforward way of tapping solar energy which, through photosynthesis, converts carbon dioxide and water into plant tissue, yielding food plants or, in this case, wood.

Coppice woods have been established since ancient times in Europe and are still widespread throughout the world, but have seldom been tried here in Australia.

The idea is to plant rapid-growing trees closely together and then harvest them on a regular cycle, cutting so that a vigorous growth of new branches will sprout, or coppice, from the tree stump.

The technique used is to cut the trunk right back to the stump only an inch or two above ground level. New shoots grow from the stump to be cut again and so on. After several cuttings the stumps, or stools, begin to decline and must be replaced with seedlings.

Australia's eucalypts have all the characteristics needed for coppicing. They are rapid growers, reaching a suitable size for harvesting in about seven years and most will coppice successfully. Other native trees, such as *Angophoras* and turpentine *(Syncarpia glomulifera)* stand cutting back well and regenerate by coppicing.

So the use of coppicing improves efficiency in yield and harvesting. It cuts down the need for extensive land clearing, cultivation and replanting operations after each harvest. It can be adapted to hilly areas and rocky or swampy land unsuitable for farming.

At the moment Australian eucalypts are being grown successfully for fuel by coppicing in Europe and America and also in Brazil, where the timber is harvested by machine for processing into liquid fuel. The CSIRO is looking at coppice-grown manna gum *(E. viminalis)* as a source of *(horrors)* wood-chip material.

We can't imagine anything less appealing than to have the beautiful Australian bush converted into a series of regular copses like those in Europe. Dorothea Mackellar has already rejected "the love of field and coppice" on our behalf in her famous poem, *My Country.*

But we feel there is a place for a hectare or so of coppice on every farm. If this is efficiently managed it should allow many more hectares of bush to remain in its natural state. New settlers would be able to obtain from the woodlot, timber for building, for fencing, for carpentry and for cooking and heating. Bee-keepers will find that flowering of trees will increase when the lush new growth forms after cutting.

It may sound a bit silly, cutting the trees to save the forest, but coppicing has its merits and drawbacks and we will hear a lot more about it in the future.

Some references

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Coppicing-with-standards, Philip Stewart, CO-Evolution Quarterly, No. 30 (Summer 1981), pp. 56-61.

Trees and woodland in the British landscape, Oliver Rackham, J. M. Dent, London, 1976.

A preliminary study of Coppice-grown Eucalyptus viminalis as a source of Chip Material, J. W. P. Nicholls & F. H. Phillips, Division of Forest Products Technical Paper No. 58, CSIRO, 1970, 28 pages.

By Charles Massy

We have been practising coppicing for many years on our farm near Cooma, NSW. The local species, the broad-leaved peppermint *(E. dives),* is excellent for firewood and fencing timber. When you cut it, it will coppice — sending up straight trunks what's more!

As well as over 80 acres of this in permanent reserves I am now (seeing we can obtain our local seed as stock) planning to use *E. dives* in tree breaks, thus providing a multiple resource: self-perpetuating timber, shelter, bee and bird food, etc.

Give trees a chance

By John & Ann Bell

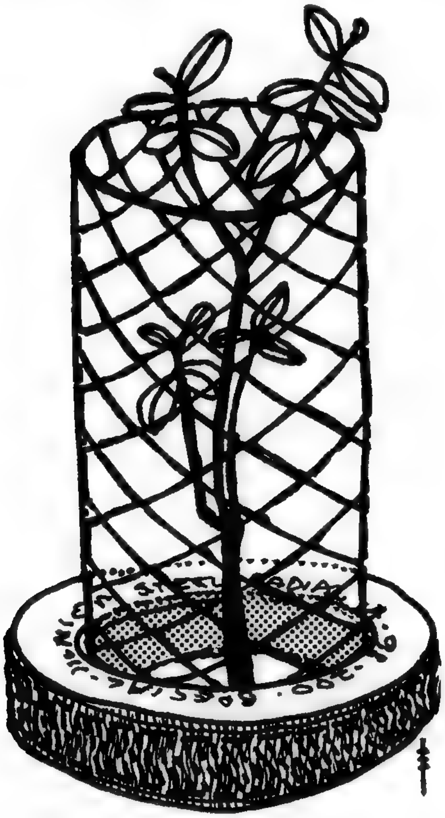
We bought almost 15 acres of land near Young (NSW) about three years ago. Apart from one corner which was fairly thickly covered with eucalypts the whole place was denuded of trees — especially the house yard!

In the time we have lived here we have planted about 150 native trees. We've had success with many species of eucalypts, especially river red gum *(E. camaldulensis)*, sugar gum *(E. cladocalyx)*, mugga *(E. sideroxylon)*, ribbon gum *(E. viminalis)*, willow gum *(E. scoparia)*, Tasmanian blue gum *(E. globulus)*, cider gum *(E. gunnii)* and white peppermint *(E. signata)*.

These trees have survived the recent drought (with many buckets of water from our neighbour's bore-water tank!). They are tolerant of winter frosts and high summer temperatures.

The trees are being planted mostly for their natural beauty, but their shade, shelter and fuel are also very important to us. Strong winds in the area are constantly bringing down branches and we are keen surveyors of our local roads for timber for our stove and fireplace.

The biggest hurdle we've had to overcome in establishing young trees at "Rockleigh" (apart from the drought) has been our Saanen goat and our geese. *Earth Garden* readers know enough about what determined creatures goats are and ours is no exception. She has broken loose a couple of times and managed to gulp down a number of trees that had been nurtured along so carefully.



We didn't realise that geese could be such a problem. The geese are free-ranging and at the height of the drought last summer, when there was a choice between nibbling at fence posts or young trees, the geese ate the trees (or at least damaged them beyond salvation).

A reasonable, cheap protection for trees (but not against goats) is to use this method which we saw in *Trees and Victorian Resources* edition of March, 1981.

We've tried this and it certainly works. It saves you the effort of driving in a lot of stakes and makes use of a resource (old car tyres) which is shamelessly wasted.

At present we are involved with a group of people in the local area who are trying to educate people in and around Young about the benefits to everyone of planting trees. We have met with a good response so far from our local paper which has been keen to print any views and information we have provided.

Our next step is to "reclaim" an unsightly part of town (with council approval we hope) to show what can be done with a few trees and a bit of effort. We are also trying to encourage the county council to improve its standard of "pruning" street trees which grow under power lines. At present the only concern appears to be to make the tree shorter, with scant regard for the appearance of what is left.

The photograph of the tree pruned by council shows what, it seems, is the finished job. It has been like that for over a month.

Let's hope that the *Australian Year of the Tree* in 1982 makes us all a little more aware of the need to plant trees and to make sure that they are not abused.

THE WOODCHIPPER BLADE

By Dusty Wolfe

The great trees of the original Australian landscape are no more, humbled by fire and man's clearing operations.

However, here and there, giant trees unsuitable for saw-milling have escaped destruction. Unfortunately, such forest monarchs have recently acquired value for wood-chipping purposes. This article is a plea for their preservation.

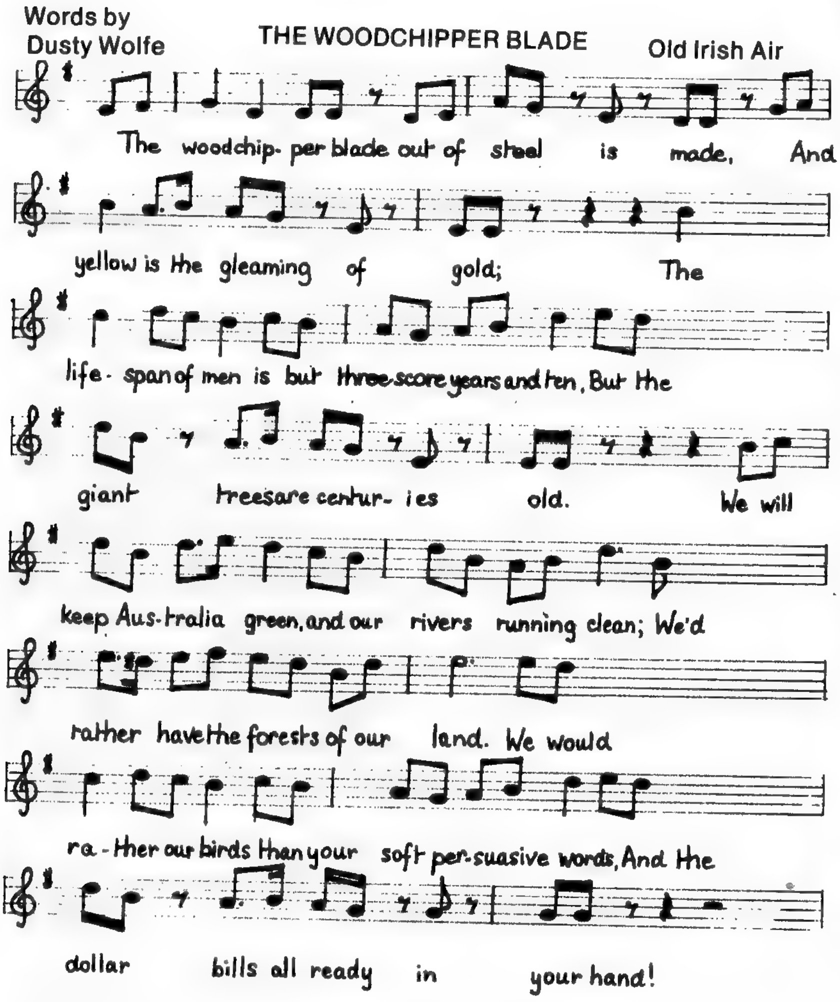
While we recognise the social and cultural value of our historic buildings and take measures for their protection, a more ancient link with Australia's past is being removed with frightening speed.

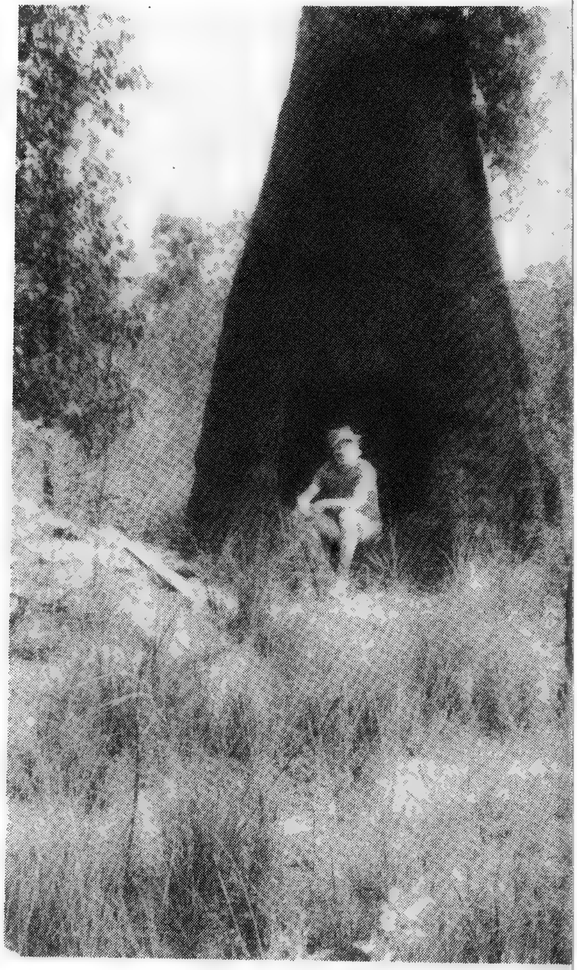
Modern equipment harvests the mountain forests in a way not possible 50 years ago. Trees once left by the saw-millers as impossible to extract are now whirled away in the twinkling of an eye. Within days the former forest giants are tossing on the Pacific Ocean in a cargo of woodchips.

Careless forestry

Sadly, our standard of forest management lags far

Mountain ash *(Euc. regnans)* near Balook, Victoria, an area where forests are being converted to short-term rotation for pulp production.


Words by Dusty Wolfe
THE WOODCHIPPER BLADE
Old Irish Air
The woodchip- per blade out of steel is made, And
yellow is the gleaming of gold; The
life - span of men is but three-score years and ten, But the
giant trees are centur- ies old. We will
keep Aus-tralia green, and our rivers running clean; We'd
rather have the forests of our land. We would
ra - ther our birds than your soft per-suasive words, And the
dollar bills all ready in your hand!



A home for somebody — Dusty and an *Angophora* near Gypsy Point, Victoria.

behind that of countries like France, Germany and Switzerland. Practices like gully-logging (see photo), clear-felling of catchment areas and snigging on steep slopes are still common in Australia.

Heavy track-moving machinery, banned from countries with advanced forestry techniques, is in general use in our forests, with consequent detrimental effect on topsoil and streams. And in many areas the forest is still considered the enemy, to be cleared for grazing and agriculture. The price to be paid for our carelessness has yet to be calculated.

The woodchipper — useful servant, bad master

Wood-chipping can be a useful method of utilising waste material from forestry operations, for example, offcuts from saw-milling. At the other extreme, it can result in the stripping of entire forests from catchment areas.

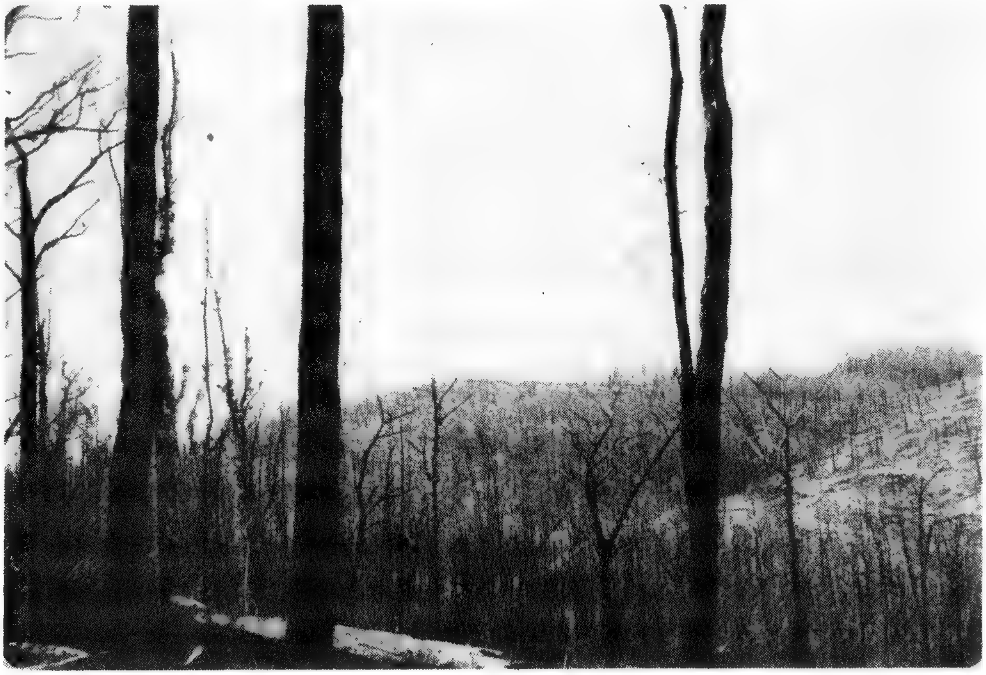
In southern New South Wales large areas of forest are being converted to short-term rotation to suit the woodchip industry. This means that the trees are no longer allowed to grow to maturity but are harvested at an early age.

The final effects of clear-felling and short-term rotations are not fully understood. All evidence points to a damaging effect on wildlife, streamflow, soil nutrient reserves and a reduction in saw-milling and employment levels. Also, wildfires in woodchipped areas are very intense due to the huge quantities of inflammable debris left from the clear-felling operation (see photos).

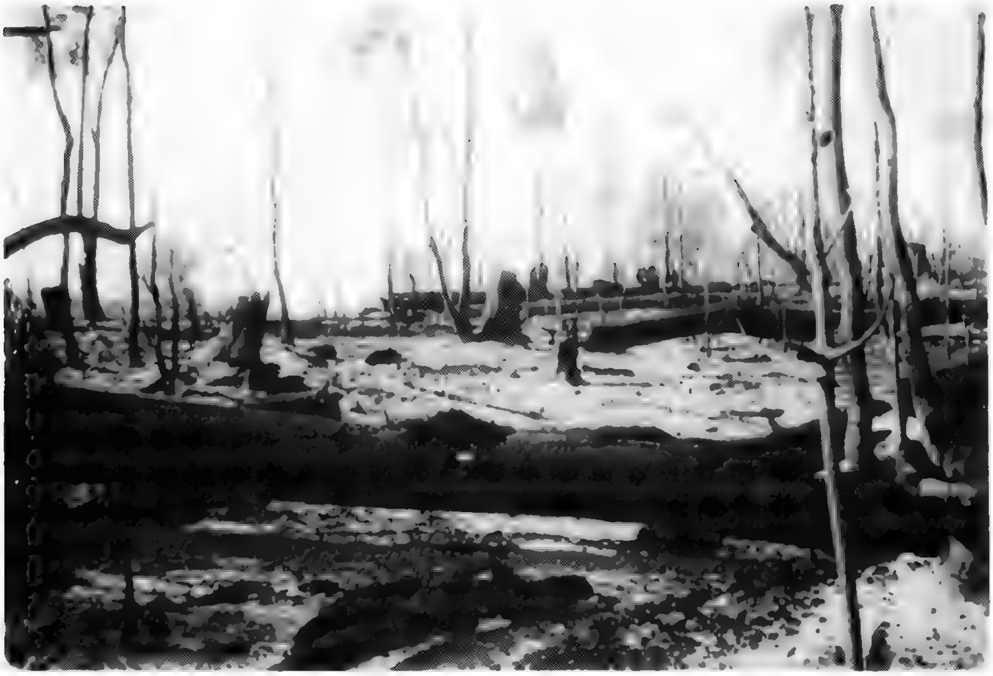
Native creatures — victims of clear-felling

A current research document presented by the Forestry Commission of New South Wales in co-operation with the Australian Museum makes the following conclusion on the effect of wood-chipping

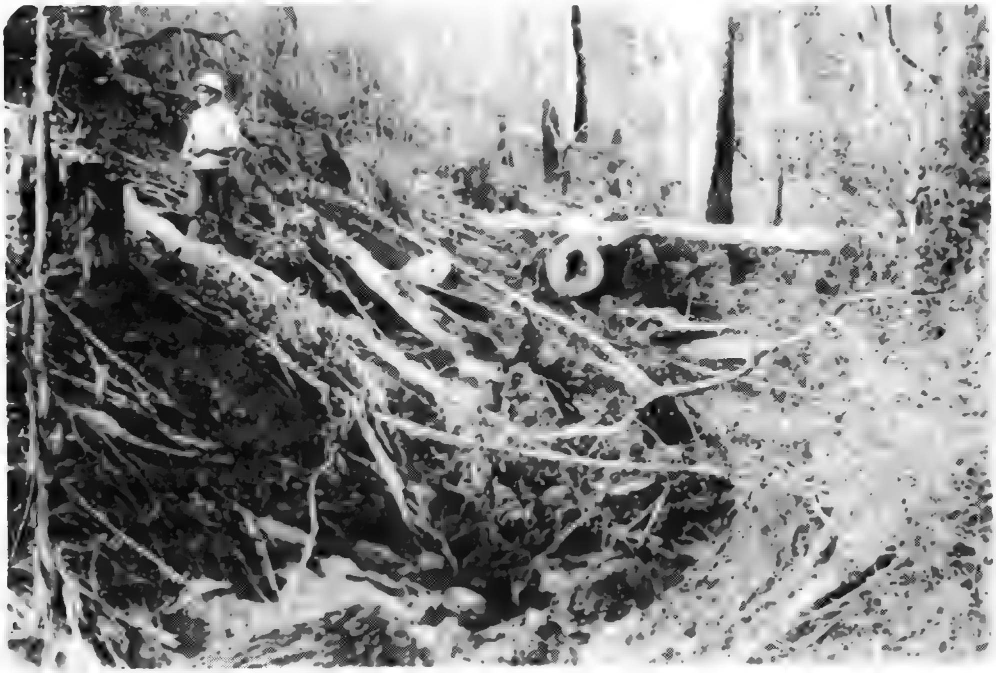
Too good for woodchips — yellow stringybark *(E.mullerana)* in the Nadgee State Forest, NSW.



Woodchipped area burnt by fire in the Yambulla State Forest, NSW. The photo was taken approximately two years after the fire.



Woodchip regrowth about 10 years old, in the NSW-Victoria border area, burnt in a wildfire in autumn 1981. Note the large quantity of debris left from the woodchip operation and its contribution to the intensity of the fire.



Gully logging in the State Forest, Wallagaraugh, Victoria in winter, 1981.

on Australian wildlife:

It is considered that the existing National Parks and Nature Reserves in the Eden District are inadequate by themselves to ensure the survival of the region's wildlife.

*Within these forests the birds and animals most likely to be sensitive to integrated logging (clear-felling) are species which require tree hollows for nesting or as dens. This includes nearly 10 per cent of the avifauna, all gliding possums and some forest bats. Clear-felling will also affect nectar feeding birds including honeyeaters, lorikeets and silvereyes.**

Perhaps an old-time Aborigine might smile at these learned deliberations of the experts, in particular at their additional observation that koalas are "likely to be sensitive" to clear-felling.

Habitat trees

The gnarled old giant trees of the bush with their hollow limbs and twisted trunks may be useless to the sawmillers, but they are of immense importance to many native animals and birds, both as homes and a source of food. Most inhabitants of the hollows are crushed during the clear-felling, while any survivors are usually killed by predators which have learned to follow the chainsaws.

Next time you pass a really big, old tree, take a few minutes rest in the shade and observed the birds hopping about in the branches far above you. Think of the furry folk sleeping in the hollows. Put your hands on the tree. It may have been standing there, just the same, centuries before Captain Cook landed at Botany Bay.

*Effects of the Eden wood-chip industry on terrestrial vertebrates with recommendations for management, Forestry Commission of NSW research Note No. 42, Sydney, 1980.

The End of the Pricklystick.

Hardly a page goes by without a description of trees or forests in this well-constructed novel of a family of Victorian timber-cutters in the days before the chainsaws changed the country.

John "Dusty" Wolfe was once a forestry man and now campaigns to save the giant forest trees.

It has always been his business to know the bush intimately. His love for the trees, birds and animals and the rural life is obvious; so is his knowledge of the timber getters' craft. And he is able to express the emotions and sentiments that make the people come alive for the reader.

The End of the Pricklystick is full of good yarns and anecdotes. It chronicles the despoilation of the forest and the impact of migrant settlers and has a strong, innocent love story woven through it too. All this makes it a darn good read.

> **Father called a crosscut-saw by the name of "pricklystick". I think he invented the word himself. And the man of the bush said that what Jim Diamond didn't know about pricklysticks and timber felling was nobody's business. He could bring out the word "pricklystick" smoothly and offhandedly, but with a wealth of meaning behind it, like the hot wind blowing off the timbered Gippsland ridges in summer, with just a trace of eucalyptus scent and a threat of bushfires. Sometimes he said "crosscut-saw" or simply "crosscut" but basically he was a pricklystick man and the sap of the messmate ran in his veins.**

The End of the Pricklystick, John Wolfe, 1980, 226 page paperback, Green River Books, Box 431, Eden, NSW 2551. Price $3.00 (post free from the publishers).

REFORESTATION

Collected papers of the reforestation seminar held at Ballina, NSW, September 13-14, 1980, edited by R. V. Clark, D. Hume and J. Seed. Bulky, large format paperback, roneoed, 206 pages.

This is an important collection of 40 papers given at the Northern Rivers Reforestation Seminar. The talks printed here cover a wide range of reforestation topics, including planting techniques, agroforestry, ecology, planning, dieback, economics, marketing and "tree awareness".

Those taking part included conservationists, sawmillers, farmers, reforestation associations, unionists and land owners. Dr Richard St Barbe Baker was the keynote speaker while Dr John French, a forest entomologist and research scientist from the CSIRO, spoke on urban forestry, which he defined as:

"The management of trees and forests in and near centre of population where trees play significant social roles in providing psychological and physiological amenities (such as restfulness, tranquility, well-being and cool, clean, sweet, moist air and quality of life), or economic benefits in human settlements."

These articles are all of a high standard and it was our intention to reprint some of them here, but we have since received so many original contributions that we just don't have the space to do so. We urge anyone interested in tree renewal to buy their own copy of the book.

Copies of *Reforestation* are available at $9.00 each, plus postage of $1.80 in NSW and Queensland and $3.20 to other States, from John Seed, PO The Channon, NSW 2480. Please make cheques payable to the Richmond Valley Reforestation Association.

Last of the Big Scrub

By Ian Dixon

New South Wales timber fanciers are rather proud of the State's coastal hardwoods and the trees in the Northern Rivers can grow to some amazing dimensions and ages.

This is because the area is blessed with some good volcanic soils, a rainfall which, while not perfectly reliable, is generous to excessive and a climate which one can regard as warm temperate on the south slopes and sub-tropical on northern aspects.

The hardwood species include blackbutt *(Eucalyptus pilularis)*, bloodwoods, tallowwood *(E. microcorys)*, white and red mahoganies *(E. acmenoides* and *E. resinifera)*, turpentine *(Syncarpia glomulifera)*, Sydney bluegum *(E. saligna)*, ironbark, brush box *(Tristana conferta)* and the very fast-growing flooded gum *(E. grandis)*, also called the rosegum.

What was not swamp in the area before our white invasion was all forest. And what was not eucalypt associations was generally rainforest. I shall not irk the typesetter by trying to list the 300 odd tree species native to the region.

The most notable was the red cedar *(Toona australis)* — the "Red Gold" of history and commerce. W. D. Francis in *Australia Rain-forest Trees* (1) says that this is "a large deciduous tree attaining 140ft in height and a stem diameter of 6ft." It reflects the general state of our native forests to say that I have yet to see a live red cedar over 3ft in diameter.

My favourite local map (2), covering Lismore, Nimbin, Byron Bay, Ballina, Casino shows an area of 3085km^2. We estimate that 2700km^2 of this was formerly forest. Counting squares we found that 234km^2 of this is shown as dense, tall forest now and of this only some 22km^2 remains unlogged (as of September, 1981).

So, although it's hard to keep on planting trees while other interest groups are cutting them down faster, there are a good few supporters for activities promoting growing trees, as distinct from simply harvesting them.

Apart from the efforts of new arrivals to the area, the last four years have seen establishment of several Reforestation Associations. These are essentially private organisations with the function of obtaining seedling trees at the best possible price and distributing them, at cost, to people who will put them in the ground and grow them.

First established was in the Tweed and Brunswick watersheds, the second covers the Richmond Valley, a third was established for the Clarence at Grafton, a fourth is now underway on the Northern Tablelands and a fifth is based at Kempsey.

These associations have attracted significant support from local governments and sawmilling companies and financial contributions are used mainly to subsidise the cost of seedlings to members. The overheads last year for the Richmond Valley Reforestation Association (3) were only 3% of the total receipts for trees and the total of seedlings supplied passed the million mark. Many of these were exotic pines but, as I say when confronted with a camphor laurel *(Cinnamomum camphora)*, much better than no tree; and many members will probably disagree with any discrimination.

Really, when you have hectare after hectare of steep, ungrazeable, intractable hillsides, struggling through the Crofton weed/lantana successions of regeneration, it might not matter too much what trees you plant, as long as they are suitable to conditions.

Re-establishing tree cover is the only positive and energy producing course to choose. The other benefits to list are aesthetics, shelter, soil conservation, flood mitigation, soil improvement and last, but maybe most important, livelihood or re-employment.

On the classical conservation front, a local group is pressing for the dedication of a Nightcap National Park containing most of those 22 unlogged square kilometres and reaching from Nightcap Flora Reserve in the east, across Terania Creek Basin, past Mts Matheson, Nardi and Neville and the Sphinx Rock, on to Blue Knob or Mt Burrell, which small virgin area is also being proposed by the Parks Service as a Nature Reserve.

We feel the chances for this Park are good, but hope it will be sooner, like *now*, rather than later, when the present logging of maiden sub-tropical rainforest and the even rarer maiden ecualypts has been done (please write to the Premier or your favourite NSW State Cabinet member).

On the other Border Ranges, Grady's Creek Flora Reserve has not yet had its reservation revoked by Parliament and so remains temporarily safe from 50% canopy selection logging.

But under more immediate threat are the 350ha of lowland tropical rainforest in the Murray Scrub, 37km north west of Kyogle. Scheduled for the saw in March, 1982, even the local foresters are said to have recommended that it be kept as a Flora Reserve. But apparently, the Indigenous Forest Policy requires the maximum economic utilisation of over-mature forests in order to fill the shortfall of timber until the exotic pines on NSW come onstream in the 90s — despite the lower costs of New Zealand and Canadian timbers in city markets (did you pick the jargon?)

The outcome of the festival at Terania Creek is still unknown. Brush box, although it was found to live in excess of 1200 years, is still regarded as a commercial species even if it represents as little as 20% of basal area among rainforest species and is still managed on a nominal 112-year rotation. The carve-up or consecration of the Washpool wilderness is still undecided at the time of writing.

The best ways of keeping your head in a highly artificial human meta-ecology may be to consider "we are the dangerous predator", study deep ecology where you live, read the poems of Robinson Jeffers (4), try the Gaia hypothesis and remember, the only societies that have achieved sustainability so far are those that treat the Earth and its inhabitants with at least the respect due to human beings.

References:

1. *Australian Rain-forest Trees,* by W. D. Francis, Aust. Govt. Printing Service, Canberra, 1970.
2. *Natmaps:* Lismore 9540 and Ballina 9640, 1: 100,000.
3. *Richmond Valley Reforestation Association,* Secretary, Bob Hannah, Bagotville Road, Meerschaum Vale, NSW, 2477.
4. *The Selected Poetry of Robinson Jeffers,* Random House, New York, 1933. Out of print, but a selection is available from Ian Dixon, PO Box 19, Nimbin, NSW, 2480 for $2.50 post paid.

Australian Year of the Tree

Environmental Committee, United Nations Association of Australia, 241 Pitt Street, Sydney, NSW 2000. Phone (02) 264 1034.

Yes, 1982 will be the Australian Year of the Tree, with a campaign by the UN Association of Australia and many other groups for public awareness and education on the concept of trees as a symbol of the environment. Send SAE for a leaflet on their plans.

This is a first step in a programme of urban forestry, rural reforestation, tree planting and the "greening of Australia", leading up to a planned United Nations International Year of the Tree in 1987 and the Australian Bicentennial in 1988. Donations for this cause are welcome!

Value of trees

By John Seed

Usually a list of reasons as to why we should reforest will begin with "timber" followed by "other values". This reflects what I believe to be a fundamental mistake in the way in which we order our priorities. A society where short-term economic considerations reign supreme is in the dangerous position of a person sawing off the branch on which he or she is sitting.

So the first reason for reforestation I will mention concerns the balance of oxygen and carbon dioxide in the atmosphere. The oxygen on earth was formed out of carbon dioxide as carbon was stored in organic matter. As the deforestation of the earth takes place (and at present it exceeds reforestation by about 8-to-3), as vast quantities of fossil carbon are burnt, more and more carbon is again transformed into carbon dioxide.

Reforestation is a "carbon sink", as trees take up and hold in their bodies the carbon dioxide which some believe to be the major planetary pollutant, threatening us via greenhouse effect with devastating climatic changes.

The next reason for planting trees has to do with the complex inter-relationship between trees and water. Trees reduce erosion on slopes and the siltation of water courses, slowing down the flow of water between sky and sea and allowing it to perform a myriad of functions on the way. The planting of trees is combating the desertification of the globe. Trees purify water and help control flooding.

The "Man of the Trees", Richard St Barbe Baker, has pointed out that humans can live only about five minutes without oxygen, five days without water, five weeks without food. So I move to the relationships between trees and the chains of food for the myriad creatures including us humans. Trees provide food both directly and in their various interactions within natural systems — moderating climate, stabilising water, fixing nitrogen and so on, which interactions are studied under the heading of agroforestry. By providing food and shelter for creatures, planting trees increases the variety and diversity of life both wild and tame.

Then there are the aesthetic and spiritual values of some kinds of tree planting. Clearfelling native forests to plant straight rows of monoculture pines would not qualify in my opinion, nor would the hypocritical gestures practised by the sand mining industry. But the repairing of degraded, derelict landscapes, often weed-infested and useless, contains great spiritual benefits for the ones who perform these merciful actions and for the planet. A spin-off of a reforestation programme is the right-livelihood generated. This has a spiritual value beyond mere employment. Benign and useful outdoor work is not too easy to find nowdays.

Finally we come to timber, the "resource". Perhaps this does not deserve to come last in the list, but it so undeservedly comes first in so many lists that some balance is called for. The attempt to maximise this one variable in the system results in the degrading of the system.

The Pulitzer prize-winning eco-poet, Gary Snyder, points out that the root of "ecology" is *eco* (Greek *oikos):* house. Ecology is housekeeping on earth. Economics is merely the housekeeping of various societies and must learn to stop taking out more than it puts back. Anticipating E. F. Schumacher's book *Small is Beautiful: Economics as if People Mattered,* Snyder asserts that "economics must be seen as a small sub-branch of ecology."

It is true that forest products are old friends of humankind, providing shelter, fuel, tools. However, when one enquires as to where most of the trees end up today — in cardboard boxes or toilet paper, burnt as sawmill waste, the several hundred pounds of packaging consumed annually by each Westerner, trees as mere cellulose — there is a definite reluctance to proffer this as a strong motive to plant trees.

On the other hand, we must take the enormous pressure off our remaining natural areas, stop the indiscriminate mining of irreplaceable native forests, and reforestation must be part of this. The fundamental problem is our culture's rapacious appetite. While we address this problem, let us find sources of wood fibre that are least destructive to the nature and stability of our mother the earth. To the extent that we regard forests as a mere resource, let them be not just theoretically renew*able,* but actually renewed. Let "sustained yield" be the reality rather than glib public relations to distract us from the fact that our forested areas are diminishing rapidly . . .

Though reforestation is in its early days in New South Wales, we have found that in order to proceed, citizens must take the initiative in tree planting, then later push for government support. It seems that governments are too short-lived and short-sighted to understand trees. Resource-base maintenance is a long-term proposition and the unborn generations can't vote. A certain amount of personal restraint and maturity is required to ensure adequate supplies of both resources and natural areas for our great-grandchildren.

More and more people are coming to appreciate St Barbe Baker's plea that we recognise that a state of emergency exists in Australia and that large-scale reforestation must begin at once. A few weeks ago he gave a lecture as he was passing through Sydney, and I was delighted to be one of the many hundreds of people turned away. The Bicentenary authority is going to call for a tree to be planted for every child, woman and man in Australia between now and 1988 (St Barbe calls for 100).

I come now to the last area I want to talk about — the fundamental change in values, the revolution in consciousness that we need if we are to survive. We must put some energy into developing a completely new approach, a new ethos that is soft on the earth and sustainable. We must promote things that humans can spend their time with that do not entail our gross patterns of consumption and pollution. The great American forester-ecologist Aldo Leopold addressed this problem 30 years ago and called for a new variety of outdoor activity asking us to involve ourselves in accumulating understanding rather than accumulating endless material.

We need a new way of looking at things. The great brush box trees at Terania Creek were recently carbon dated as 1200 years old. What is the replacement value, that is the economic value of such a tree? Professor Odum at the University of Florida insists that this is its true value and his economic view is gaining ground. Compound interest on the cost of a seedling for 40 or 50 human generations? Worth hundreds of thousands of dollars.

As economist Hazel Henderson points out, mainstream economics is a variety of brain damage. Economists have become so stupid as a result of leaving the most important variables out of their equations, habitually disregarding the biological truths of life and ecology, that most of them couldn't grow a cabbage. What then is the replacement value of the natural, untouched ecosystem which includes those old brush box? Irreplaceable. What is it worth? Priceless. People's intuitive understanding of true economics explains our vigorous defence of this treasure . . .

I suggest that to be most effective in conserving nature we must move some of our attention from the front line of campaigns and confrontation back to our hearts and spirits, our lifestyles and relationships with each other. This work needs to take place within the conservation community and it is counter productive to be too busy saving the world to take care of it.

A few days ago I looked up the meaning of *homo sapiens.*

homo: Any of a genus of primate mammals comprising all surviving and various extinct men.

sapiens: Wise.

homo sapiens: . . . recent man as distinguished from various fossil men.

If we wish to maintain this distinguishing characteristic, *sapiens* will have to become less of a boast, more of a reality.

This article is made up of extracts from John Seed's address to the Wide Bay Conservation Council conference on Forestry and Nature Conservation at Gympie, Queensland, given in May, 1981.

RESCUE THE RAINFORESTS

Australia has lost three-quarters of its rainforest, from eight million hectares to two million ha and the loss continues. Our rainforests contain plants found nowhere else in the world. About one-third of all eastern Australian butterflies, some 113 kinds, cannot exist without rainforests.

These are some of the groups fighting to save these vital and beautiful tree places. They need your support. Send SAE when writing to them.

The Rainforest Information Centre, Cnr Bridge and Terania Sts, North Lismore, NSW 2480. Send SAE for leaflet, Lismore's Forest Remnants.

Terania Native Forest Action Group, c/- Channon PA, via Lismore, NSW 2480 (see Save a Rainforest, EG14).

Australian Conservation Foundation (ACF), 672B Glenferrie Road, Hawthorn, Victoria 3122. The ACF also publishes *Habitat Australia* magazine, 32 pages with colour photos, six times yearly, price $15.00 annually.

Total Environment Centre (TEC), 3rd floor, 18 Argyle Street, The Rocks, Sydney, NSW 2000, is the headquarters for campaigns to safeguard Australia's urban, green and marine environments, such as the effort to save the Washpool wilderness in NSW and other rainforest areas.

There is a well stocked bookshop at the TEC, which will be holding its annual *Book Fair* sale from November 27 to January 15. Hours 10 am to 5 pm Monday to Friday and 12 noon to 5 pm at weekends.

Man of the teas

I've always felt that tree and man should go together. An amazing thing is that "tree" is the first word that I ever said. My mother explained this to me. When she said that it wasn't "Mum-mum-mum" or "Dad-dad-dad", I then remembered being so small and running up and putting out my hand and saying "tee", "tee"! And while I still drink tea, which is a great word in my vocabulary, tree was the first word that I ever said.

Artist in the bush

NEIL DOUGLAS TALKS TO EARTH GARDEN

Down in the garden there's a cabbage. Now that cabbage can suddenly die. When you look at it, it's covered with aphis, it's over-populated. And you realise that it hasn't suddenly died — it's just that you hadn't been looking.

One day there were two aphis, the next day there were 2000, the next day two million aphis and then there were two billion aphis! At some stage the cabbage turns yellow and dies.

Now the earth is a cabbage. If we're not over-populating it, we're over-polluting. The only way we can stop this (if we look, as we didn't look at the cabbage) and stop it in time is by having a sense of balance and orientation. Well, as we say, *You can't eat the gum leaves.* You've got to cut down some gum trees to grow wheat.

So, after a long time, there's a Ministry for Planning and a Ministry for Conservation (there weren't any when I was a boy). Their job is to keep a balance. But we still run, as Mr Whitlam found, on economics and the old history of economics. It's very hard to suddenly change over to a planned philosophy. We still have the old philosophy that the earth is a resource, as the Forests Commission says or, as the Bible says, *Go forth, multiply and subdue the earth.*

Now we have a Minister for Conservation. With that background, what is his peck order in Cabinet? It seems to me like getting a tiny little flag and pinning it on one of the aphis on the cabbage and saying, in a minute voice, *"Minister for Conservation,"* and expecting to stop the inevitable process.

The Labor Party thinks that the problem is really a problem of jobs, that conservation will stop jobs. The Liberal Party thinks that conservation is a problem of dollars, that conservation will stop dollars.

Mr Snedden, as he was (now Speaker, Sir Billy Snedden), appeared on television at the time of the sacking of Labor's Minister for Conservation, Dr Moss Cass and said: "Good enough, too, now let's work it out." He tapped a finger to tick off each point. "Now let's consider, What is conservation? That is tourism. Now what is tourism? That's trade. An office in the Ministry of Trade is all you want for conservation."

Now that was so recent, when Snedden was in the race to be Prime Minister, that probably most people in the Liberal Party — and in the Labor Party for that matter — have not changed their philosophy. And it's not only the philosophy of economics that we want to change to keep a balance, it's our philosophy of approach also.

In this regard I had to talk about the threat to the Franklin and Gordon Rivers in Tasmania at a meeting in Eltham recently. At first I said: "Well, I know nothing about them. I've read a lot about it, but I would have to spend quite a lot of time, which I haven't got, to find out what it is. But if you like, I'll come down and speak as an artist." So they asked me to come and speak on that basis.

I got up and said, "Napoleon said that the British were a race of shopkeepers and that goes for Australians too. They'd sell their grandmothers if they thought they could make money out of it.

"Look at what some of them are doing with the meat scene at the moment, internationally, wrecking one of our major export industries, just for the dollar."

If the trees could talk, they'd probably ask Neil Douglas to go on being their public relations man. And the weird flowers, spindly shrubs, quick, invisible furry animals and inquisitive birds, the stark sticks and rocks would all entreat him to continue as their interpreter in his characteristic paintings of the erratic and fantastic presence we call the bush.

Neil has been called "a walking gum tree", and wearing his gumleaf-dyed suit, handspun, woven and made up for him by Abbie Heathcote, he looks as fringy as the undergrowth around their mudbrick home at Kangaroo Ground in Victoria.

We recently spent a few crowded days with them, learning a bit, laughing a lot and absorbing knowledge and ideas with the atmosphere. Everything there seemed to have reached a peak of maturity. The young forest of messmate and ribbon gum, a regrowth from a bushfire many years ago, was tall and lush after winter rains while native plants we'd never seen before had popped up in places where the foreign grasses had been removed. The house seems just right too, simple and cosy now that it has been weather-sealed and the greenhouse added.

Neil at the age of 70 was spry, wry and full of new energy, painting tropical bush scenes from their recent Queensland visit, campaigning, gardening and drinking lots of tea. Abbie span as she talked, so as not to waste time between writing, painting her own canvases and weaving. Biddy, who was only eight years old when we first met her, startled us with her beauty as a young lady and she has begun to paint strikingly too.

Melissa, who has a special rapport with Neil, was delighted to be there, watching each morning as the cheeky choughs and bright rosellas came to peck at the window for a feed and at night as the honey glider came down the tree for supper.

Abbie and Neil have put down their way of living in the bush, their art, outlook and philosophy in a series of delightful yarns, stories, drawings, photos and paintings with tips on building, gardening, crafts and eating in their two books, *The Book of Earthly Delights* and *A Far Cry*. The good news is that some stock of *Earthly Delights* has turned up recently. Both books are available from them by mail at $10.80 each posted from PO Kangaroo Ground, Victoria 3097.

Neil Douglas has a lot to say about trees. He paints them and fights for them. We asked him this: "You're an artist who sees the Australian bush and its trees in a special way. Why do you think trees are so important?"

This is where big business has to be bridled in the name of naughty business. Too many of them think that the earth is a resource. The Forest Industries people of Victoria said, in the first statement in their rationale, *The forests are a resource for man.* As long as the forests are regarded as a "resource for man", we're going to go in, without proper aesthetic inspection, without proper aesthetic safeguards, without proper knowledge of the future, or of how trees affect the earth.

As long as it's a crop, the forest is regarded as timber. I'd rather call our Forests Commissions *Timber Commissions.* They have certain words like "climax", when the forest has reached "maximum growth". Now to an artist this may be true part of the time. In our mountain ash forests, for example, to regenerate them you have to raze the whole forest, by bushfire or by bulldozer or by clear felling, and you sow a new mountain ash *in ash.*

If you don't do that, after a cool fire or just left to natural decay, you gradually get a mixed forest. It's not until some terrible onslaught that the mountain ash forest will come — from the bed of ash or from total wreckage caused by a cyclone.

That's alright in some places. But it's a pity, very sad, if this becomes a proper forest philosophy, where a mountain ash forest is *only* a mountain ash forest. In time, some might be totally mountain ash forest due to nautral onslaughts, but others will change into a mixed forest and will perhaps be mixed forest for thousands of years. How the Forests Commission can say they need "managing", when they looked after themselves for 200 million years before even the Aborigines came here, I don't know.

Looked at from the point of view of an artist, there's something the matter with us. Napoleon was quite right in what he said. We have an economic outlook, a resource outlook, first.

If you're an artist, you go in with respect, with love, with feeling, with sympathy to something which is beyond our knowledge. We still don't know what part forests play in the whole ecology of the earth. We do know that every second that I'm speaking, 40 acres of forest is knocked to the ground, according to David Bellamy, the British botanist who came to Australia recently.

If we keep on knocking our forests out at that rate, we could very seriously upset the earth's oxygen balance, the greenhouse effect, and the creation of oxygen by the tiny plankton skin on the ocean and we don't know the ratios of that sort of thing to the area of forests. We know that forests can increase the rainfall one inch in Victoria one mile to the east of rain sweeping across from the west. For the first mile you get an inch more after a mile of forest. That sort of thing we know.

We also know that between Western Australia and Melbourne there's an area of land the size of Victoria which is now salted and useless for agriculture (unless they find something to grow on salty country) as a result of raising the water table in the valleys because you've knocked the forests off on the hill and all the water rushes down. Whereas under forest, the soil is spongey and the water gets to the river very slowly over the whole year and the springs keep running. There's no need for me to go into all those sorts of things.

I said to one big meeting, there were 800 people there, "Look into your hearts and see what it is that makes the Minister for Conservation such a small fry in the peck order of the Cabinet. It's always economic, as Jo Bjelke-Petersen says. It's always the economic, the 'commonsense' approach, that wins over the 'close to the heart'."

As I keep saying, "You can't eat the gum leaves." You've got to keep a balance. But when there's only 6 per cent of forests in Australia (now 5 per cent since I last heard) and we allow wood-chipping from a country that has over 50 per cent of forests — Japan — it seems to me that sometime, very soon in the future, as David Bellamy says, we will have to think about the balance of rainforest left.

The most amazing thing about them, which came out in the CSIRO journal *Ecos* recently, is that, instead of forests coming down to Australia (I mean jungle forests from Asia), in fact the jungles of the world could have *originated* in the Australian region. One of the ways they test this is the number of species, or variety of the same species, in a small area, an indication that this is a very old source of evolution. There are more species and numbers of species in the Australian jungle forests than there are so far ascertained in other jungles around the world.

So Australia could be the source of jungles. And these little pockets of jungle, where the rainforest flora and fauna keep growing, are the ones we are thinking of wiping out altogether. These are permanent reservoirs and they should be kept.

David Bellamy also made the point that we still don't know how, really, to make safe chemistry to help us in our life and industrial processes. Whereas the plants can make chemistry, a lot which we don't even know about yet, but it's not unsafe chemistry, we still have a lot to learn from plants. If you pour so much black slime or juice from the soil, you squeeze the soil and you put it into a little tub of some kind, you can grow plants in it, or you can make that soil juice up under the science of hydroponics. We can't directly *make* a potato out of that juice, but a plant can. We haven't learnt how. It takes that black juice and makes a potato out of it, or a peach.

In the factories now, they're learning how to put in so much material and out comes plastic. This has all happened in my lifetime. The first plastic that preceded me, I think, was the celluloid that used to be on the old T-model Fords. Since those days, when I was a boy, plastics have made a great takeover. Only last night on the telly in *Towards 2000* (ABC television), they were explaining how for the first time they'd found how to make something useful out of waste plastic. In fact they made a paint, which you can knock with a huge sledgehammer. It was the only type of paint which, they demonstrated, doesn't splinter or flake off and isn't affected by sulphuric acid.

Now, a lot of this stuff we can still learn from trees; medicines from trees and other things we don't know about because they haven't been tested. The story goes that the famous "pill", on which everybody depends today, was discovered by accident by the scientist finding out how to make rabbits fertile and, by the same work, discovering that you could make them infertile. Applied to human beings, this became the contraceptive pill.

The source of these experiments was an old tribal legend from Mexico and it was the juice of a plant. There were very few plants left because of the growth of Mexico City, with estate agents and buyers rapidly putting into extinction the sole remaining area where this particular plant came from! This was before they synthesised it. The man who discovered the chemistry of the pill only beat the real estate agents by a year or two.

How many more plants are there which estate agents and owners in the forests resource economic programmes of industry are putting out of commission? How many that we don't know about? A lot of these could be absolutely vital for our survival on the earth and the survival of the animals and crops that we live on. And we've only just woken up to the importance of the gene pools which help in improving the uses of plants. We can lose these if we don't leave varieties of the same plants in their natural stands.

I had to do a talk on wood-chipping at the Assembly Hall in Melbourne. The Forests Commission people were there and it was pretty difficult because I'd just been preceded by an amazing man who knew the economic and financial side. He showed that in the case of the port of Eden, in New South Wales, they'd neglected to add to the sum of the profit and loss on wood-chipping some $3 million needed to build the wharf!

I had to follow him, so I walked up and down in Abbie's hand-spun, hand-woven, hand-made suit, dyed with gum leaves. We were pretty exhausted after listening to this chap. He was one of the most volatile speakers I've ever heard. So I thought I'd start by saying nothing.

I walked up and down the platform in deep thought, you see, but looking at the audience, until it became a little embarrassing and people started to fidget, wondering when I was going to begin. When it got to a point where you couldn't possibly let it go any further, I said, *"You know, they call me the walking gum tree."* I immediately got a marvellous raising of attention. There had to be some singular technique to take their mind and rejuvenate it, and I got it.

So when I saw that they were all standing up and ready again, I said that Dr Moulds, chairman of the Victorian Forests Commission at that time, had said in a letter to a newspaper that the Forests Commission proceeded in a democratic way on the findings of the Lands Utilisation Council. Now this is a trap, I tried to explain, if you consider how, in only 10 years, public opinion has changed and how 20 years ago there wasn't a Minister of Conservation. In accepting the findings of the Lands Utilisation Council today and accepting the philisophy in which members of that body are chosen, we're not taking care that today's findings won't seem not only out of date, but suicidally out of date, in five to 20 years.

The Forests Commission are laying themselves open to be caught out by time, whereas they should be proceeding with the greatest of care, allowing for a total change of approach to forests and the philosophy of keeping a balance. The danger is that they have not allowed for that further change against the economic over-weighing, the *life* aspects, that we're there *with* the forests and not over the forests. Our present government approach is just not good enough.

We shouldn't have to fight for things. We shouldn't *have* to fight for the Franklin and the Gordon Rivers. We shouldn't have to fight for the last jungles of Australia. We should see a proper impact study, created by the technology we have at present. Both sides of the debate, if their hearts were in balance, should see, *not* a great wrangle and a fight with each side disagreeing with the other, but a proper, dignified, intelligent approach, based on the proper balances between our heart and our hungry stomach. Otherwise, our hungry stomach is going to knock us out.

I had a friend, Tansy Dyason, who was the daughter of the chairman of the old Melbourne Stock Exchange. When questions came up that were difficult and it looked as though the right side was losing, she used to say to me, *"The monkeys are winning, the monkeys are winning."* I've always thought that was a marvellous phrase because we forget that we're monkeys, really, we've just walked out of the jungles and taken over the earth. We still have the monkey's feeling of curiosity, unbridled curiosity, and we exploit what we have the power to exploit, without having the heart to think about it.

In painting trees the artist is not only celebrating how beautiful they are, he's celebrating how extraordinary they are. If there weren't any trees and it was all grass and you suddenly saw a tree, you'd be amazed!

If you took our tallest tree, a mountain ash of 327 feet in the Cumberland Valley, about 70 miles north-east of Melbourne (where the tallest hardwoods in the world grow) and planted it in Collins Street or in Martin Place or in the centre of Adelaide, Brisbane or Perth, only then would you realise what an extraordinary thing a tree is. Then, when you think of a tree that high, which lifts itself out of the earth, when you think of it pushing water up all that 327 feet, it's a scientific marvel as well as an aesthetic marvel.

We have to try to present this concept to people, but not forgetting saltbush, out in the West, is just as marvellous as the trees. A lot of people who think about trees also forget the swamps. Swamps have got a bad name, they're quagmires, people say *"swoompp"* — they hate them. They've got to clean them, they've got to drain them, they've got to tidy it up. Again, we've found out only recently what a vital part mangroves play in the fishing industry and in keeping the waters around our coast unpolluted.

Unfortunately right across NSW, South Australia and Western Australia, they're not keeping comparison areas on farms or stations to see what untouched, unmanaged, ungrazed saltbush looks like, how it behaves and how it makes the climate and the soil behave. We allow the stock or the cattle access to the whole bloody lot. To have an area big enough to find out how the farmer may depend on it, you have to fight the farmer! It's ridiculous. It's the economics and the natural greed (of course greed *is* natural, people have to feed their children and so on), but it's very short-sighted. People should get together and save some of the saltbush.

I went across to Perth with Jack Darmody, who was then a columnist for *The Age* and we travelled over 2000 odd miles of saltbush. I was amazed at the degrading of both the soil under the saltbush and the bushes themselves. Jack couldn't see it. But we finally came to a water tank and here was a triangle roped off with barbed wire and in that area, which had not been touched by cattle or sheep, the saltbush was three to four times higher than it was in all that 2000 miles, though it was the same species.

It wasn't due to the water, because it was some distance to the troughs, where the water would be. It just hadn't been grazed. Between the saltbushes were dozens of blooms of species of creeping, flowering plants, so that you could not see the red soil. But the saltbush in the grazed area was not only stunted, with dead sticks sticking out of it, but between every one of them was three to four feet, or perhaps six feet, of flat, red soil. So there was tremendous erosion and lack of water saturation between the saltbushes. But where the saltbushes had not been grazed there was no erosion between them, you couldn't see the red soil and it was so spongey that there would have been very high absorption of what rare rain came down and was steady enough to penetrate the thin, low vegetation.

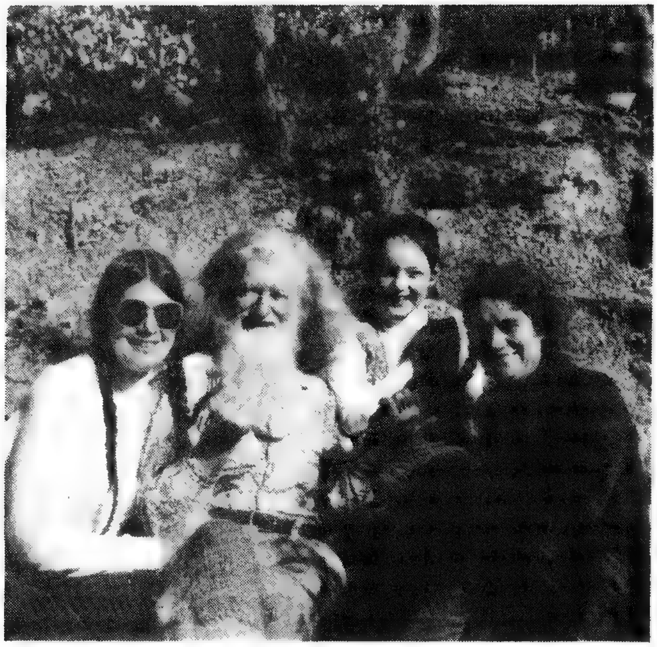
Driving to Ayers Rock we'd go across cattle grids, because the roads are not fenced. This is one of the terrible things about Australia: in the outback they let the cattle and the sheep, or pigs, or whatever, have access to the lot. So in the distance you gradually come up to a creamy, buffy looking patch. You think, "What's that? It must be sand or something." Then you realise that it's perfectly straight, along a fence. Then, when you cross the cattle grid, you go in to what you then discover is a National Park — from red country, dusty country, absolutely flat and blowing in the wind, and the mulga trees with their boughs lying in a circle flat on the ground around the trunk because the trunk is dead — the sheep have been allowed to eat the leaves which lie under the tree. The leaves protect the very shallow surface roots of the mulga, so the tree dies without them.

But in the National Park, there they are, beautiful mulga trees, all silvery, amethysty colours, grey. The whole landscape looks dead, because it's in the middle of a drought and it's summer, but every one of those trees and the ground cover garden is alive. I found ferns, *ferns* in Central Australia! They were covered with beautiful brown fur about half an inch thick.

I found plants that looked like they were made of copper and others that seemed to be made of wrought iron. Some seemed to be made of silver, or beaten out of metal of some kind. There were leaves like paper, absolutely dry, but still alive; leaves twisted in a certain way like shells to keep the sun off them. Every conceivable dried arrangement was there in the most beautiful variety. Now this is perhaps even more important than Australia's trees because it's 2000 miles of it at a time. All this is soft and spongey underneath. But let the cattle, or sheep or horses in on it and the texture of the soil goes hard from hard-toothed animals, which is a point made by Jack Absalam, another artist who saw the additional side of it to what an economic man sees.

So please don't forget the swamps, the heaths and the scraggy stringybark country which the Forests Commission hates and likes to clean out and plant pine trees instead. They call it "cleaning up" because it's a "dirty" paddock, it's "rubbish".

The heath country plays its own part again and they also like to plant pine trees on that. I know pine trees are probably one of the fastest ways of utilising sunlight, faster and better perhaps than anything invented yet in the way of solar cells, so perhaps the best way to harvest sunlight might be to plant pine trees and use the energy from them. But there's no need to do it and have the philosophy that anything else except the pine forest is "untidy rubbish" and has to be "cleaned" up, because in a world where we'll shortly perhaps have a lot of leisure, what are we going to do with ourselves?



Happy days! Irene, Neil, Melissa and Abbie at Kangaroo Ground.

We're back to the artist now. What are we going to do with our time? What are we going to do with our minds? Now love is one of the nicest and most wonderful things about leisure. It's not only recreation, it's inspiration. And this is a vital factor that today's planners, being based on their economic training, forget. Today's planner divides the world between utility and recreation for the weekend or the holidays. Now, they totally leave out the artist's point of view, which is inspiration. They say, "Oh, well, we mean that by re-creation."

We need utility areas, we need recreation areas and we need inspiration areas, not just for recreation either. You don't send a lot of kids playing cricket or riding around on ponies or that sort of thing (that's recreation) into a beautiful patch of bush with orchids and wild plants. The orchids get stamped out, the dogs and cats chase the wildlife out and finally it's a dead area.

There must be, always, this constant reminder in our economic civilistion that a "useless" patch, for which we use the word "waste" — *waste* if you please! ... In Western Australia they have the Barren Ranges, not named after a Baron, but because they're considered to be barren. And when you go on to them, they're the haunt of the most marvellous animals and birds and wildflowers for which the whole world pays to come and see — and it's called barren!

This is a very good indication of what I'm talking about, our utilising, resource-minded civilisation, which has to be cracked sooner or later, not by the Conservation Minister who is low on the peck order, but by the voter, who's educated and wakes up and insists that the Conservation Minister has as much power in the Cabinet and is the top personality, not a low-rating personality, as any other member of the Cabinet. And he *has* to be a top personality to take on the Minister of Trade, the Minister for Exports, the Minister for Roads and the Minister for Finance. He's got to be able and willing to take on these economic aspects in order to keep a proper balance.

Tall Trees

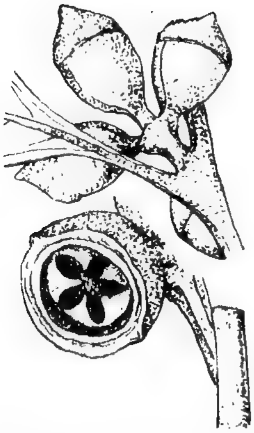
Mountain ash *(Eucalyptus regnans)* is the tallest hardwood species in the world. Today the Californian redwoods in America are the tallest living trees, but these are softwoods . . .

The tallest known tree in Victoria is in the Cumberland Valley, near Marysville, 97 km from Melbourne. This tree once measured 91.7 metres but during the early 1960s wind damage had reduced this height to 83.8 metres. Its girth, three metres from the ground, is 5.2 metres, and it is probably 200 to 250 years old.

The Cumberland Valley trees are the tallest known in Victoria at present, but these are surpassed by trees growing in the Styx River Valley in Tasmania. The tallest there is 98.7 metres, and eight others in the stand rise over 90 metres. It is estimated that these trees are about 250 years old.

Tasmania, therefore, has the tallest known mountain ash in the world, but it could be that another giant may be hidden away in a lesser known forest gully that will again write Victoria's name at the top of the record of world trees.

Extract from *Tall Trees,* Information Sheet No 6, Forests Commission Victoria.



Eucalyptus cosmophylla

TREE SEEDS

A wide range of seeds of Australian trees (including acacias and eucalypts) and exotics is available from the Forestry Commission of NSW. You may buy a 10g packet of seeds for $3.00 to $8.00 or start a forest with 1kg of seeds, priced at $60 to $320 (depending on class of seed). A sample packet, with a mixture of seed sizes and an amazing number of seeds, costs $3.00.

Seed price list from: *The District Forester,* PO Box J19, Coffs Harbour Jetty, NSW 2451. Mark envelope: Attn: Seed Store.

The Society for Growing Australian Plants, which has branches in all States, runs a seed bank for members from which tree seeds may be obtained. For information on the Society, send SAE to 860 Henry Lawson Drive, Picnic Point, NSW 2213.

Department of Forestry, Queensland, GPO Box 944, Brisbane, Qld 4001. Tree seeds are available, write for a price list.

Nindethana Seed Service, Wellington, NSW 2820. Send SAE for list of seeds available by packet or larger amounts.

Tasmanian Forest Seeds, T. G. Walduck, "Summerleas Farm", Kingston, Tasmania 7150. Send SAE for list of 50 species of tree seeds for sale which include the Tasmanian bluegum *(E.globulus).*

Rainforest stock

Terania Rainforest Nursery, Terania Creek, The Channon, NSW 2480 (17 species).

Roy Lilley, Wilsons Creek, NSW 2482. Send SAE for details.

more land lines

We are looking for land in the Wingham-Wauchope-Kempsey areas, about 100-300 acres. The main requirement is a good river frontage and we would also like a predominantly northern aspect. Some arable lands are desirable also. We don't mind isolation and run-down or regrowth areas present no problems. Buildings are not really necessary. We are farmers and builders and would tend the land on sound conservationist principles. We will have $40,000-$50,000, but could possibly raise more if the perfect spot is a bit above our range.

Dael Allison and Rick Haughton, 8 Grahame Drive, McMasters Beach, NSW 2251. Phone: (043) 82 1872 or (043) 82 1357.

I am looking for a capable, motivated carpenter to help me build my rural alternative home. The land is near Berry, 90 miles south of Sydney. The house will be a log, pole and shingle construction, gable-roofed and 10 squares in size. It should be about 4 months employment and a healthy lifestyle shared with an independent, self-taught woman builder. Construction will begin in the New Year, so if you feel comfortable with big logs and a chisel, please write. Wages and accommodation negotiable.

Dency Christian, 8 Gibbens Street, Camperdown, NSW 2050. Phone: (02) 519 6575.

For sale: 150 acres, $45,000, plus 2000 acres of State Forest lease for $70 per annum, located in the south west slopes of NSW. Reliable climate, rainfall 1000 mm +, 100 acres cleared. Timber ranges from red stringybark/apple box to peppermint/white gum associations. Excellent permaculture potential.

Also 145, 244 and 456 acre portions available within the same valley. A permaculture pre-design report is available at a nominal fee for any of the land mentioned. In the future, small land units should be possible by buying into a Land Trust.

Contact Neil Druce, Wangara Nursery, PO Box 80, Tumbarumba, NSW 2653.

I have for sale 60 acres of mainly forested land, 12km south of Gympie, close to Mothar Mountain State Forest. The land ranges from creek flats with good soil (there is rainforest along the creek), to gently sloping land, then to higher country with a view to the mountains. The adjoining two blocks are owned by myself and a friend, so I am looking for some like-minded people who will care for the forest to buy this one. The price is $22,000.

Please contact Margaret Hamlyn, 128 Weekes Road, Moggill, Qld, 4070. Phone: (07) 202 6711.

Due to transfer of work we are selling our part-finished mudbrick house and 33 acres of land at St Arnaud in Central Victoria. Land is well-fenced, with a large dam, waterholes in the creek, goat paddock, shade trees and a shearing shed with timber yards, also a large storage shed. House is basically finished, walls, roof, windows and floors, with a septic tank installed, plus 7000gal concrete rainwater tank and telephone but no SEC.

There is a combustion stove providing hot and cold water to the kitchen sink, living area has Cathedral ceilings and an open fireplace. Land is adjacent to State Forest which has abundant wildlife, walking or riding tracks and peace. The town of St Arnaud is 6 miles away and the school bus stop is ½-mile from the house. We are asking $24,500 with terms on $15,000 deposit. No lower offers accepted.

David & Diane Overton, PO Box 60, Mt Beauty, Victoria, 3699. Phone: (057) 57 5238.

We have 70 acres of nicely timbered land, with a dam and a small hill. It is 4 miles from town, with a school bus going past the door. We have built a 30ft x 20ft shed and made it quite livable. There is a generator, another small tool shed, a full dam, three tanks, calf pens and yards, a house cow, 10 calves, a goat and chooks, fruit trees and plenty of wildlife. It's about two hours north-west of Brisbane. We would like $35,000 for the lot.

Contact David Allan & Rosemary Hansen, MS 346, Nanango, Qld, 4315.

NIMBIN NOTES

Working in the Nimbin Neighbourhood & Info Centre Office we get so many enquiries for land in this area and it hurts me to see and hear the eager expectations turn to bitter disappointment.

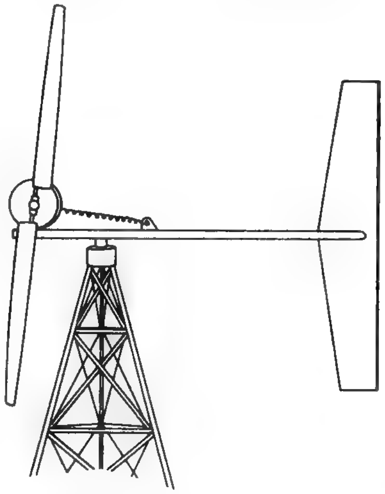
Sadly, this land of promise has attracted so many people that land values (and population) have exploded and there is no longer any cheap land in the area.

So be prepared to have to look long and hard for anything cheaper in this immediate area. I'm not categorically saying it can't be found, but be prepared. Remember too, the smaller the acreage, the higher the cost per acre.

Best wishes, Pauline Williams, Nimbin, NSW.

The Co-ordination Co-operative (EG 31, page 27) has changed its mailing address to PO Box 26, Nimbin, NSW 2480.

access



South Wind

Bulletin of the Australasian Wind Energy Association

Quarterly, 16 pages, subscription/membership $8.00 annually ($12.00 for institutions), from PO Box 1965, Canberra City, ACT 2601.

This small magazine has weathered its first year, in the process growing from a newsletter into the bulletin of the AusWEA. The magazine is edited by Mark Diesendorf and John Carlin and contains general and technical stories aimed at keeping its readers abreast of research ideas and developments in wind energy in Australasia and overseas.

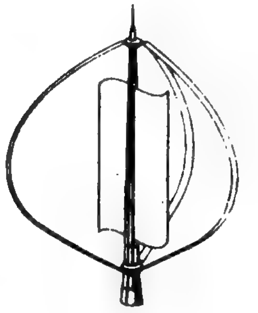
The recent double issue, Nos 4/5, has a list of commercially available wind generators and articles on aerodynamics of wind engineering, experience with wind power in Wales, Denmark and Holland and water energy storage.

The Wind Power Book

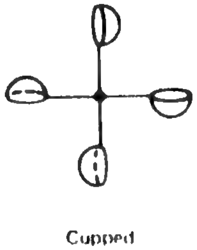
Jack Park, Cheshire Books, Palo Alto, California, 1981, 253 pages, large format paperback. Price $14.95. Distributed in Australia by Second Back Row Press, PO Box 43, Leura, NSW 2781. (add $1.00 postage).

Jack Park pretty well covers the whole wind power story here, including planning a complete wind system, from the tower to building the blade, with projects for tinkerers like building a sail-wing water pump, a Savonius rotor, a Darrieus hoop or a wind generator.

"The book explains the technology as well as the theory of wind power in a realistic way," says environmentalist Robert Redford in the foreword (yes, he is an actor too).



Savonius/ϕ-Darrieus



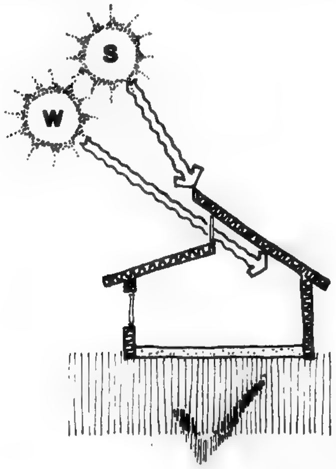
Cupped

Solar Energy Information Centre

Top floor, 33 Playfair Street (Argyle Arts Centre), The Rocks, Sydney.

The Solar Centre is a branch of the Energy Authority of New South Wales in which you can see displays of solar equipment, such as solar water heaters and photovoltaic cells and use a model to study the path of the sun during the year to help with the design of a low energy house.

The Centre is equipped to advise on technical problems and has leaflets and books on solar energy available. Open seven days a week from 10 am to 5 pm.



Energy Information Centre

Gas & Fuel Corp, 139 Flinders Street, Melbourne (opposite Flinders Street Station).

Energy displays include a low energy house model, insulation and solar equipment. You can take along your house designs for comment and advice. Many free leaflets available. Open 9 am to 5 pm weekdays and 9 am to 12 noon on Saturdays.

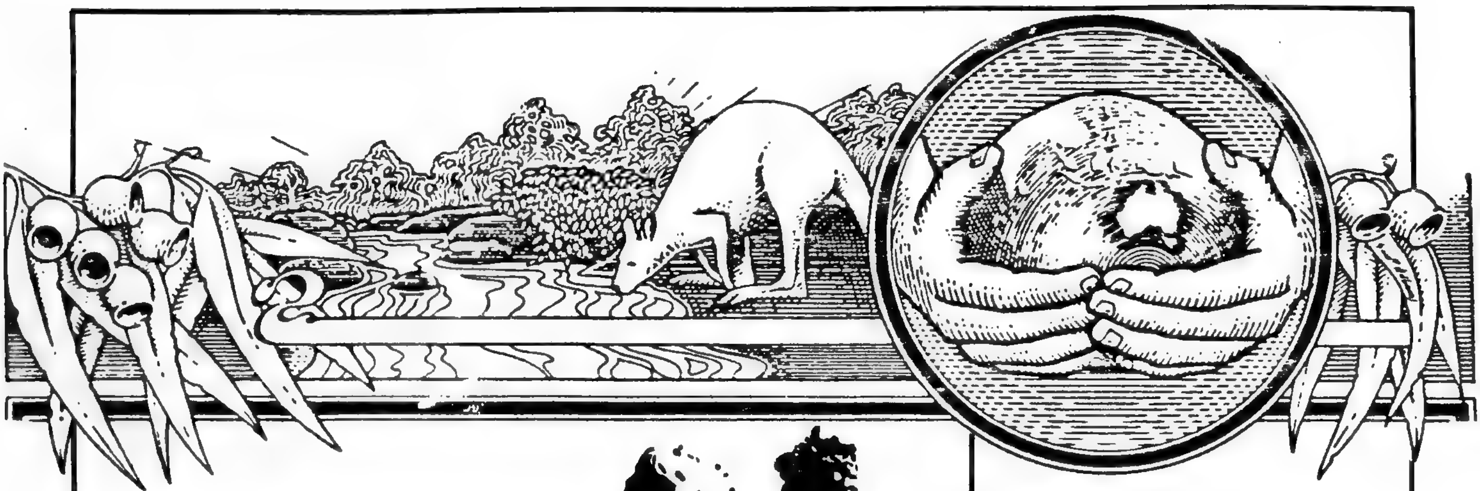
Solar food dryer

The Bornhoffen solar food dryer can be used on the patio or in the backyard to dry and preserve (without chemicals or processed sugars) fruit, vegetables and herbs. See the photo of several in **Earth Garden 30**, page 31). Price about $40.00.

Solar Food Drying

A how-to-do-it-and-why booklet, by Gabrielle Brown, contains practical tips on drying methods. Price $1.00.

Both available from: **Good Farmer Browns'**, PO Box 619, Toowoomba, Qld 4350.



CONFEST '82

Alternatives Conference Festival

Glenlyon Reserve, near Daylesford, Victoria, Australia Day weekend, January 28-February 1, 1982.

The Down to Earth (Vic) Co-operative Society Ltd plans a Thursday-to-Monday Confest featuring workshops, talks, films, alternative technology, permaculture, meditation, human growth, massage, alternative medicine, diet, networking, children's activities, healing village, market, music, dancing, swimming, good food and drinks.

Adults $20.00, under 16 free at the gate, or $15.00 if you register before December 15 at DTE, 2 Stephenson Street, Richmond, Victoria 3121. Phone (03) 428 6866.

(Information from Warren Kriger.)

MOORA MOORA FESTIVAL

Moora Moora Co-operative community is holding its annual Festival on Saturday, February 27, 1982. Tours of the co-op, demonstrations of building, craft activities and a bush dance will be featured.

There is very limited camping accommodation. If far-flung Earth Gardeners would like to camp with us over that weekend, please write to Sandra Cock, Box 441, Healesville, Victoria 3777, no later than February 13, 1982.

Books by mail

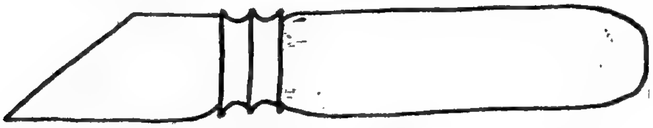
Robinson's Book Shop, 7 Central Park, Frankston, Victoria 3199.

Philip Robinson is now putting out a quarterly newsletter, *Round Robin*, with thumbnail sketch reviews of books which may be bought by mail. Includes practical books, dictionaries, literature and small publishers. Send stamp when enquiring.

Robinson's Book Shop

CASEIN HANDLE TABLE KNIFE

BUY AT SECOND HAND SHOP OR TRASH 'N TREASURE - 20¢.



CUT BLADE SHORT WITH FILE OR EMERY WHEEL TO MAKE HANDY VEGETABLE KNIFE.

For survivalists

F & T Journal, roneoed newsletter, 6 issues, $10.00 from PO Box 11, Dickson, ACT 2602.

This little journal is for people who believe in the "crash scenario" theory that disaster of one sort or another will overtake us sooner or later and who are making plans to survive.

Articles fit in with lowering of consumerism and increased self-reliance, with stories on axes, salvaging useful items, hurricane lamps, household recipes, freezer emergencies, useful hints and even financial advice.

Building A Log House

Part 2

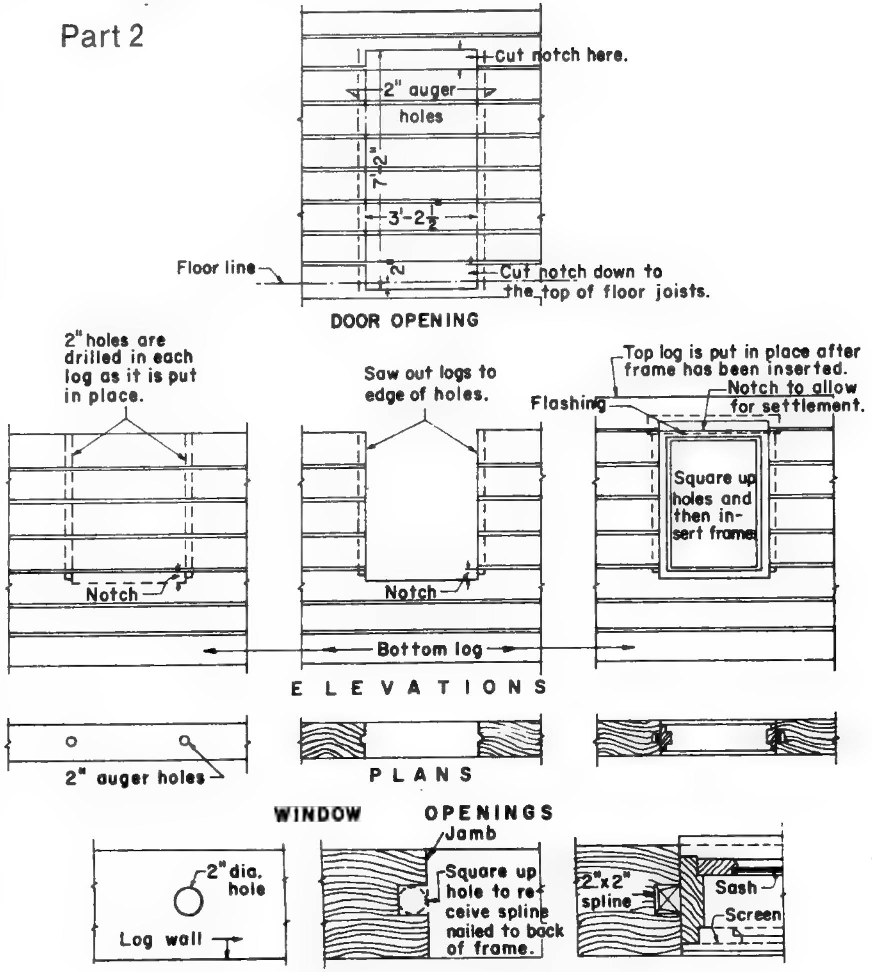
WINDOW AND DOOR OPENINGS

As soon as the first round of logs and the floor joists are laid, mark the location of door and window openings on the inside face. Next, saw out the door openings and chop out the notch in the doorsill log to within one inch of the true or finished line (Fig. 8). Leave the final cutting of the openings to the exact dimensions until the window and door frames are to be placed in position, thus insuring a good finished wood surface. Also, determine the height of the openings above the floor line and mark them in figures on the bottom log for reference. The necessary cuts should be made in the log directly over each opening before placing it in position. When the log which carries the window frame is reached, a notch must be made for it as for the doors.

To provide the necessary doors and windows, openings must be cut in the walls after the logs have been placed. As soon as a log in the wall is cut in two, the problem arises of how to hold the loose ends in place. Also, the doors and windows require the proper kind of frames to insure airtight closure between the windows and the ends of the wall logs. The most practicable and satisfactory method is to frame a vertical notch in the ends of the wall logs, into which can be fitted a spline attached to the back of the jamb or sidepieces of the door and window frames. This method of framing holds the wall logs in place, allows them to shrink and settle without hindrance, and makes a weather-tight joint between them and the door and window frames. The vertical notch in the end of the wall logs may be framed by boring a two inch auger hole in each log as it is laid in place. The hole should be located so that, when the wall logs are sawed out for the opening, the saw cut passes down through the edge of the hole nearest the opening. Then it is easy to frame the notch to take the spline. The inside face of the notch can be left rounded and the spline chamfered to fit. To keep the holes in line from log to log, use the plumb board (Fig. 9).

WINDOW AND DOOR FRAMES

There are two ways of making window and door frames — in three pieces (two side jambs and one head jamb), or in four pieces (two side jambs, one head jamb, and a sill piece). When a three-piece frame is used, the bottom log of the opening is cut or shaped to make the window, or doorsill, and the jamb pieces are then fitted to the sill. If the jambs are framed from pieces of log slabbed on two opposite sides, you will have a presentable frame in keeping with the log character of the structure. The window or door face of the jamb pieces may be rabbeted for the windows and doors, respectively, or they may have separate wooden pieces, known as stops, nailed on. The


Cut notch here.
2" auger holes
7'-2"
3'-2½"
Floor line
2"
Cut notch down to the top of floor joists.
DOOR OPENING
2" holes are drilled in each log as it is put in place.
Saw out logs to edge of holes.
Top log is put in place after frame has been inserted.
Flashing
Notch to allow for settlement.
Square up holes and then insert frame
Notch
Notch
Bottom log
ELEVATIONS
2" auger holes
PLANS
WINDOW
OPENINGS
Jamb
2" dia. hole
Log wall
Square up hole to receive spline nailed to back of frame.
2"x2" spline
Sash
Screen

DETAILS FOR PREPARING OPENINGS TO RECEIVE THE FRAMES

FIGURE 8. — Cutting window and door openings.

spline on the back of the jamb may be rabbeted out, or a two by two inch piece of straight-grained wood may be nailed on. The head jamb can be framed in the same way; it does not require a spline on the back. Each side jamb has a dowel framed on each end. The bottom dowel fits into a mortise in the sill and the top dowel fits into a similar mortise in the head jamb.

In a four-piece frame, the sill log is cut with a slope, in the customary way, and the jambs are fitted as for a three-piece frame. Figure 10 illustrates the installation of three and four piece window frames.

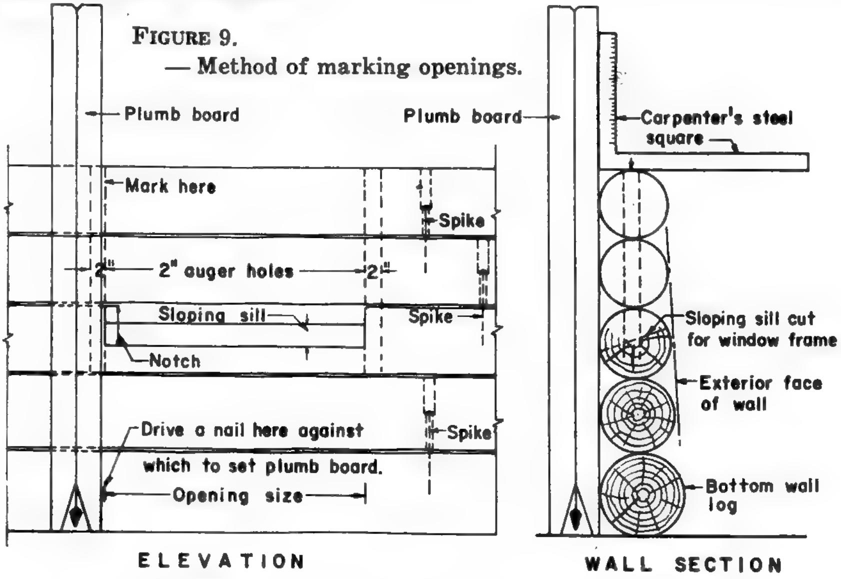
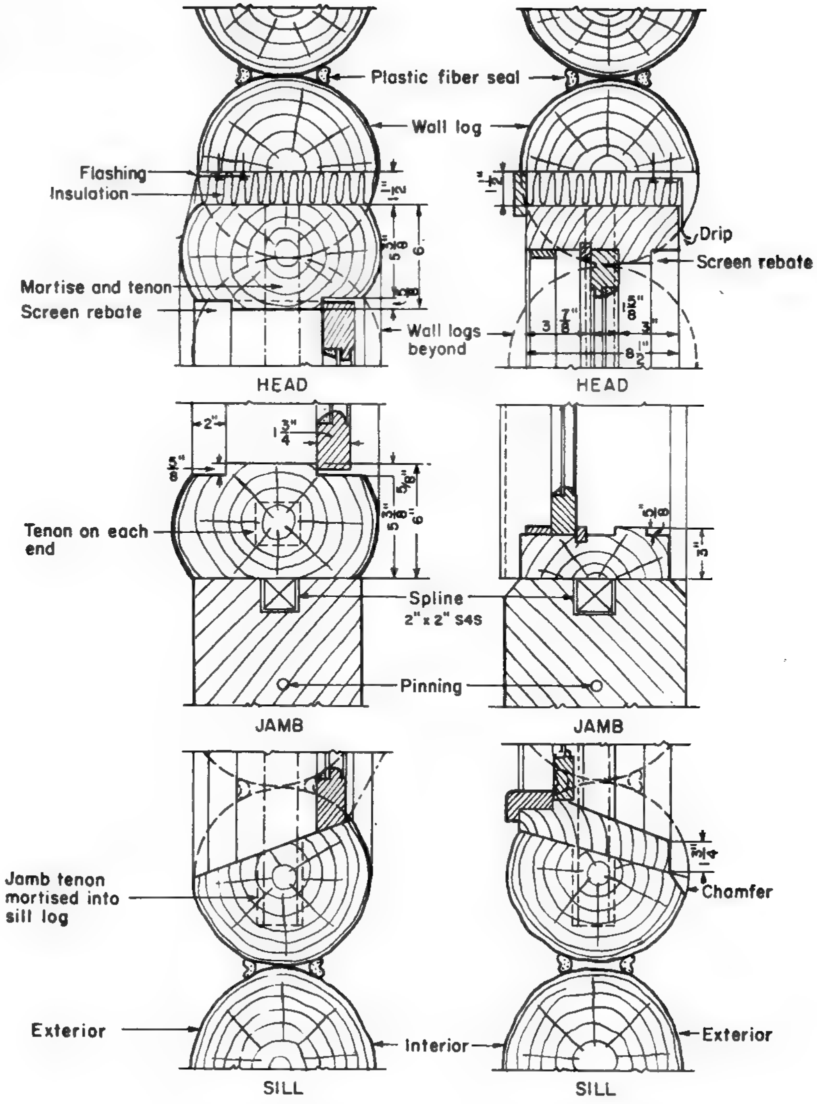


FIGURE 9. — Method of marking openings.

When the head jamb or top log over the opening is reached, the frames are ready for installation. The opening is cut out, the sill fashioned, the vertical spline slot framed, and the head jamb log cut out to fit over the opening. At this point, the amount of settlement resulting from the shrinkage of the wall logs, as they dry out, must be determined and a corresponding allowance provided in the opening. This allowance is made between the upper side of the headpiece of the frame and the bottom of the log directly over the opening. It should be from two and one half to four inches for a door and one and one half to three inches for an ordinary double hung window. The log over the opening should be notched out on the under side so that it can be dropped in place after the frame has been set in position.

When the type of window or door frame described here is used, neither outside nor inside casings, sometimes called wood trim, are required. The logs selected for the jamb material should be two to three inches larger in diameter than the wall logs, in order to fit properly. Also, they will be much easier to work with if well seasoned



CASEMENT WINDOW FRAME USING LOG JAMBS

DOUBLE-HUNG WINDOW FRAME USING SAWED MATERIAL

FIGURE 10. — Window frames.

(To be continued next issue.)

earth people write

Dear Keith & Irene,

Re building permissions:

A White Elephant is a mouse built to Council specifications!

Regards, Ray Hawthorne, Mt Lawley, Western Australia.

Dear Earth Garden,

Please will you say thank you for all the letters I received in reply to my letter in EG 31. I got so many, I couldn't possibly reply to them all. My daughter Cathie got lots too, but she's managed to answer quite a few. Thank you.

Yours faithfully, Muriel White, Wynyard, Tasmania.

Dear Irene & Keith,

An item of interest which readers might like to know about is the value of a common Australian swamp reed, **Phragmites Australis**. This plant, with a fondness for blocking irrigation channels, is being used in a village in Germany named Othfresen (of 2500 people) to treat raw sewerage. Waste water is pumped into a paddy of one hectare of Phragmites and comes out the other end a few days later pure enough to drink!

I believe the CSIRO in Griffith is now doing some investigation into this humble reed and two similar ones, **Typha** and **Scerpi**. Concentrated effluent from a piggery and chookery is being fed into them to further test the capacity of these plants to purify water (Ref Local Govt Bulletin, March, 1981).

May I recommend that **Earth Garden** readers consider trying to become involved in local government. It is easy to hide in our plots and ignore the overuse of pesticides, herbicides and the destruction of the environment around us. Without some changes in local laws, people are being penalised for functioning in an alternative way (such as multiple occupancy). Seeing the destruction around here, I nominated for the last local government elections, with a simple environmental platform, and much to my amazement (and that of the establishment), I am now on the local council. While I lose on many issues, I have managed to get some changes over up here.

Keep up the good work, Anudhi Wentworth, Byron Bay, NSW.

Dear Sir,

I would be grateful to you if you could kindly publish my name and address to look for penfriends aged 17 years onwards. My hobbies are football, table tennis, reading, music, postcards and letter-writing. I am aged 19.

Richard Boby Smith, PO Box 940, Cape Coast, Ghana, West Africa.

Dear People,

I'd like to say a few words about populating the North. Not for defence or any of the other stupid reasons given by the Canberra mob, but simply this: From a few miles north of Cairns onwards the north is very thinly populated and it wouldn't need very many new settlers to shift the whole social balance in favour of ecologically-sane living.

The first wave of new settlers in the early '70's sought land that was either solid rainforest or had a spectacular ocean view and a great many of these people are still here, but this type of land is now very expensive. There is, however, a lot of land which has little or no rainforest and no ocean view for sale at decent prices (considering the inflationary times). This land is well within the wet tropical belt, no more than 20 miles from the coast. Some examples: 320 acres freehold inland from Port Douglas for $40,000; 640 acres freehold with some rainforest and a mile frontage to a permanent creek for $60,000. These blocks will support many families. A whole valley with a river running through it, waterfalls and rainforest, some old sugar cane land, near Port Douglas, a million dollars — sounds a lot, but 100 families, with $10,000 each could settle there.

To anybody who has never visited the tropics the climate is almost unbelievable; a properly organised orchard and garden can produce food 12 months of the year. I'll be pleased to correspond with anyone seeking further information.

Yours, Peter Mitchell, PO Box 140, Mossman, North Queensland, 4873.

Dear Keith & Irene,

I'm a very busy working mother (and grandmother) and the pressures of my dual roles gets me down sometimes. There are two things guaranteed to soothe my disturbed spirit:

(1) A few hours hard work in our vegie garden.

(2) A quiet read through my **Earth Gardens**.

Thanks for helping me with the former by publishing the latter. I use many hints and ideas in my garden gained from EG reading. Being too busy to spend too much time in the garden I have to use short-cuts, like mulching between rows and plants (and over the winter) with at least 6 inches of spoiled hay. The heavy drought has cut off our hay supply so last year we used newspaper (at least 20 sheet thickness). It worked like a charm . . . and no hay seeds sprouting!

Kind regards, Helen Staubner, Exeter, NSW.

Dear EG Readers,

We have been keen **Earth Garden** readers for some time now and have found a lot of terrific info and ideas are passed on for all. One thing we have found missing though is a good "Swap Shop" type paper or magazine. Over the years we have found that people of all ages are keen to swap rather than buy articles they require, be it toys, clothing, furniture, appliances or food. So I am hoping that I can raise enough interest and contact people who would wish to use this type of barter.

To begin the broadsheet would be bi-monthly and later (hopefully) monthly. The cost would be $1.00 for printing costs per issue, plus an SAE, so that we can send a copy to you. I am keen to get started, so I hope to hear from you all soon, with your opinions and ideas on this.

Love to you all, Margaret & Bruce Pelvin, PO Box 58, Woodburn, NSW 2472.

Dear EG Readers,

We have just been transferred to Gin Gin and would appreciate making contact with any of you in the Bundaberg-Gin Gin area. We have a young baby and are trying to buy a farm so that we can try alternative living.

Love and Peace, Chris & Darryl Wright, C/- State High School, Gin Gin, Queensland, 4671.

Dear Keith & Irene,

My wife and I had a baby (Angela) 12 months ago and now we are to have another in five months. We are very busy starting from scratch on our own land and doing our own building. The thing we need to ask **Earth Garden** readers is this: is there an experienced midwife out there, who, if we hired all the necessary equipment, would come and stay with us free board in February-March next and deliver our second baby?

We would pay the midwife's fee and she would have her own room. I must tell you we are in the foothills of the Snowy Mountains, very isolated, no power and only a bush shower. I hope someone wants to come, as the nearest hospital is 40 miles of dirt road away and does not cater for natural childbirth.

Yours sincerely, Neil & Lesley Fitzsimons, "Two Creeks", C/- PO Towamba, NSW 2550.

Dear Irene & Keith,

I would like to know if there is anyone out there feeding a family of five from their own garden, or is it just an impossible dream?

Thank you, Bev Rochford, 56 Kent Road, Orchard Hills, NSW 2748.

Dear folks,

I represent a group of parents who are about to begin building a school for our 28 kids. The school will aim to dissolve the barriers between home and school, and to develop basic practical and reasoning skills through a thorough immersion in the local environment. We will be parent-owned, parent-built and family-controlled, with every school member sharing in decision-making and management.

At the moment we are fully enrolled 'till 1986. Primary age children 5-12 can undertake membership with their families after that date. We've got to set a limit on enrolments as we are holding strongly to the "small is beautiful" concept. As our children reach high school age, we will either support them as family members in their own schools or develop an altenrative high school age programme.

At the moment we are scouting around for a second teacher, experienced in primary age general teaching, willing to take a four-day week for a reduced salary (around $8000) and great working conditions! Also, if any people in the world at large would like to come and stay with some of our 16 families while helping us build the school, please let us know. We hope to begin in October or November this year and we'll be at it all of the beautiful Tassie summer months.

Any groups seeking an ecologically sound project within which to test or promote energy efficient means or materials will be welcomed with open minds! By the way, our group is not a rich collection of bourgeois genius-breeders. Our families cover a broad socio-economic spectrum and our fees are only $300 per year. In the words of an old crank named Neill, we want to help the children learn to live, not just to make a living.

Thanking you, Rob Andrew, Mt Arthur Family School, Box 67, PO Lilydale, Tasmania, 7254.

Dear Earth Garden People,

We moved from the city to the country a few years ago and with much joy and gusto purchased our first Angora goats along with a few acres. Now, 4½ years later, we really have more goats than we can easily handle and as my husband has a job and many other interests as well, we feel we have to sell quite a few.

We wondered if any **Earth Garden** readers — perhaps just starting off with their own farming/land ventures — might be interested in purchasing some. Ours range from first cross animals through to pedigree does and bucks, with prices from about $10 upwards. We also have racing pigeons, chooks, geese, quail, a dog and two goldfish and our organic garden. Please contact us if interested.

Thanks for a marvellous magazine. Peace and good health to all.

Myrna McColl, RMB 8240, South Wangaratta, Victoria, 3678.

Dear Irene & Keith,

Enjoyed the article on **Freezing Food** in EG 31. Have used my deep freeze for years and would advise anyone who owns one to investigate having the contents insured. A small amount yearly for this type of insurance and the cost of contents is refundable in case of electricity failures due to storms or cyclones, etc.

Regards, Ellwyn Elms, Darling Heights, Queensland.

Dear Irene & Keith,

We are considering buying a bush block of at least two hectares and we would be grateful if any readers can provide us with advice and opinions from their personal experiences in building their own home. Even after reading your many articles and G. F. Middleton's **Build Your House of Earth**, we still find there are many questions that are not answered for us "laymen" on mudbrick building.

To learn by experience is most rewarding. If any readers are building abode homes in the central region of Victoria, we would be pleased to assist in labouring on weekends.

Kind regards, Robyn Grimes & Harry Fleurie, 6 Scott Street, Macedon, Victoria, 3440.

Dear Keith & Irene,

It's good to read of what others are doing with their land. At the moment I am marking time as I have a few months to finish off my Nurses Aide training. Then I'll try to get work near my property, near Gulgong, NSW. I have 23 acres with a creek frontage and two dams. I would like to hear from other **Earth Garden** people in the Mudgee-Gulgong area and learn their experiences as I am still "green" and need all the help and information I can get.

Keep up the good work, Arthur Johnson, Flat 1, "Leisure Lea", View Street, Lawson, NSW 2783.

Dear Irene & Keith,

Just a note to let you know we look forward to your magazine and please keep up the good work.

We took the plunge and sold our home in the suburbs of Southport and moved into the country. First of all we couldn't find a block for the price we wanted to pay. We found an estate agent who showed us various blocks (outside our pocket). He mentioned this block and said **'it's a bit wild, I know you wouldn't like it!'** We talked him into showing us. It was rough but had a lot of possibilities. We bought it and started to build a carport. We put our old house up for sale, sold it and moved into our carport.

Our children like it and I don't think they miss town at all. They've become involved in nature and if we mention that we are going to town, they will stay home and work on some project they would like to see 'finished'. We are keen gardeners, so with the steep nature of our block, we got a Bobcat in to cut terraces in the hill. The garden is going nicely. We've planted fruit trees and bought some fowls to run among them. The taste of free-range eggs is something to behold, so we've found out.

We've started to build our own home. It is double brick. We hope to do it all by ourselves. We collect hints as we go. I'm afraid I'll have to go back to the rat-race soon as the money is getting low. It will be a drag as we love the peace and quiet of our little world. We're pleased we've made the break. To all those people out there considering making the move, do it, you'll come to terms with life better I'm sure. Thanks for listening.

Yours sincerely, Beth Cooling, Gilston, Queensland.

Dear Irene & Keith,

Your magazine is a 'ray of sunshine'.

I am hoping in writing this letter to contact some 'earth minded' people around my area.

We have lived on our land for nearly four years now, but unfortunately Shane works a full time job as we have a mortgage. If we hadn't got the mortgage, we would still be in the suburbs trying to save — and you know what that's like!

We built our own little home here and moved in Christmas 1979. The inside isn't finished, no bathroom or wall lining yet. With weekends only to work, we are still trying to weatherproof the outside, plus general maintenance and animal care — we are always flat out.

During the week, I'm kept busy with goats, chickens, cats and dogs to care for and, most important of all, our vegetable garden. We have a combustion stove and I bake bread and museli and make butter and do all the other jobs like chopping roosters and getting food on the table. We don't buy any red meat at all and only buy food that is necessary to save more for the 'current project'.

We love our busy, peaceful life here and look forward to the day when Shane can leave work so we can do much more with our place, plus have the time to enjoy it.

The only thing lacking is similar minded company. We get out very little to meet people, but it's a very old community here and there doesn't seem to be any young couples buying land. We'd love to hear from anybody living near. It would be great to be able to 'winge' to someone else about the chickens going off lay and the unknown disease on the fruit trees and the likelihood of the drought breaking.

Best regards, Joan & Shane O'Dwyer, M.S. 435, Lowood, Queensland 4311.

Subscribe now and save $1.00!

Dear friends,

With this issue, our last for 1981, most postal subscriptions to *Earth Garden* expire. If yours has run out, you will see that we have stamped the words *Subscription now due* on the back of the envelope in which we sent your copy.

Quite a lot of you have already subscribed for next year. Thanks. We're grateful for that because, unlike other magazines, we depend wholly on sales to our readers, and not on money raised from advertising.

These people are saving money and you will too, if you subscribe now for 1982. From our next issue, EG33 (out in February), the cover price will be $2.25 per copy in shops and newsagents and $10.00 for the four issues posted.

Because we are reluctant to make this increase, we intend to hold down the price of a subscription to $9.00 (the 1981 rate) until the very end of the year, that is December 31, 1981. The higher prices will apply from January 1, 1982.

We think the value is still in *Earth Garden* and we promise that the quality of information will be maintained. This first price increase in three years has been forced upon us for several reasons: the Federal Government's sales tax on books and magazines (and information); higher postal charges due this December; and the inescapable pressure of inflation on costs of paper, printing, production and art supplies.

Subscribers receive *Earth Garden* in their letter box at home, paying just 25 cents per copy for postage and packing. This saves time and effort searching around in bookshops and newsagents. We get a nice feeling of being able to have a headstart on costs so that we can get on with our work.

Why not give a gift subscription to a friend? They will receive something they appreciate four times during the year.

As you probably know, *Earth Garden 33* will be a landmark issue, because it marks our tenth anniversary. We would like to hear from readers on how they spent their last decade and if EG helped (or hindered) them in changing their lives. It will be a "mixed bag" of useful stories because we have so much good material in hand right now.

Some of the special topics we plan to cover during 1982 include herbs, low energy houses, pole building, China and, of course, more on trees during the *Australian Year of the Tree.*

The Earth Garden Library

With the publication of *The Settler's Guide,* we now have five books in print. These are the *First, Second* and *Third Earth Garden Books,* the "best of" issues 1-10, 11-20 and 21-28 respectively. We are extending our special offer on these companion volumes and will post all three anywhere in Australia for $28.00.

The *Illustrated EG Herbal,* a quality book which would make a perfect gift for anyone in love with herbs, is $9.95 posted from us. *The Settler's Guide* is just out (see inside front cover) and priced at $13.95 posted.

We are always delighted to hear from you, with comments, stories, hints and suggestions which we can all share.

Our offer of "the lot", EG1 to EG36, covering our first decade (!) remains open — still $61.50 posted.

Happy New Year!

Peace and love,
Irene and Keith.

EARTH GARDEN, PO Box 378, Epping, NSW, Australia, 2121

Prices — includes postage

Single issues: **EG1-EG10 — $1.25 each** .... **$**..........
EG11-EG14 — $1.45 each .... **$**..........
EG15 & EG16 — $2.00 each .... **$**..........
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Back copies

EG1: Move out ... food co-op ... earthworms ... kibbutz & moshav ... herbs ... access key ... Fred Robinson ... bean sprouts ... Montsalvat ... organic growing ... comfrey.

EG2: Organic farm ... start a garden ... Neil Douglas the garden artist ... Kiewa farms ... keyline system ... drying & storing food ... hydroponics ... compost garbage ... nutrition.

EG3: Herbs ... making compost ... fast fertilizer ... all about goats ... companion plants ... mudbricks with Neil & Abbie ... water wheel ... domes ... salads ... bread ... pottery ... spinning ... vegies.

EG4: A pleasant treatise on the honey bee ... working bees ... sources ... back to the land in Tasmania ... the transition ... black sheep cycle ... tanning ... candles ... bread ... domes ... donkeys ... wall hanging.

EG5: The wind — windmills ... windpumps ... generators ... raku pottery ... Cinva ram ... keeping poultry ... Hamburghs ... moon planting ... vegan way ... fallout shelter ... just 9 acres ... garden tools.

EG6: Solar 1 — sun cults ... solar cooker ... sundials ... the lost world ... Clifton Pugh ... concrete house ... Shalom ... Cajun cookin' ... animal care ... horses ... spirit of Nimbin.

EG7: Solar 2 — hot water ... solar ideas & sources ... good company ... Angora goats ... make a leather bag & belt ... survival skills ... mushrooms ... natural dyes ... mudbricks again ... flight from the city.

EG8: Gas power — methane digester ... power from the pig pen ... by truck to Tassie ... just ¾ acre ... cumbungi hats ... Harmony Farm ... inkle loom ... tapers ... country cottages ... A-frame ... school gardens ... sourdough.

EG9: Alternatives to petrol — LP gas ... Mary's place ... building with stone rubble ... oats ... ducks ... macrobiotics ... horse & cart ... rug frame ... natural farming ... how to kill a pig.

EG10: Granite house ... bamboo flutes ... geese ... chip heater ... make beehives ... mudbricks yet again ... Jarrah shingles ... methane ... Bio-dynamics ... tandem ... seaweed ... Index (EG1-9).

EG11: Water — hydraulic ram ... water wheels ... miller's tale ... okra ... seed primer ... heavy horses in Quebec ... tomatoes ... soft technology ... start with hens ... wine ... hard cheese.

EG12: Keeping food — drying ... salting ... bottling ... storing ... meditating ... tahu ... tobacco ... tropic delights ... plant propagation ... plans for a solar water heater (part 1) ... solar stills ... solar cooker ... Moora Moora.

EG13: The bush — men with axes ... woodchips ... native garden ... flora & fauna ... national parks ... wild places ... wildlife ... bushcraft ... solar hot water plans (part 2) ... straw & paper garden ... producer gas ... Jerusalem artichokes.

EG14: Self-sufficiency — gardens for all ... Botobolar vineyard ... Abbie's goats ... Terania Creek ... millet ... Crusoe ... Thoreau at Walden ... Helen & Scott Nearing ... healthy soil ... we built in stone.

EG15: A Lytel Herball — growing and using herbs, with text and illustrations from the classic 16th century herbals with modern commentary ... companion herbs ... herb sources & books ... Index to EG15.

EG16: A Lytel Herball (Parte II) — comfrey, lavender, wormwood, yarrow ... people & the land ... poultry shed ... Moora Moora ... peafowl ... goat notes ... basic beekeeping ... building in pise (rammed earth) ... miracle pump.

EG17: All about fencing ... dry stone walls ... make nets ... your own soap ... Autonomous house ... pole shelter ... breeding black sheep ... owner-builders ... asparagus ... Aeolian harp ... Khaki Campbells ... 'D' for duck.

EG18: Fruit garden — oranges ... lemons ... olives ... nuts ... tropical fruit ... fodder trees ... build a road ... homebirth ... wood-fired pottery kiln ... Cinva-ram cottage ... earthworms ... hulling sunflower seeds.

EG19: Wood heat — pot bellies ... Jotul cooking ... making a quid ... build a storage cellar ... bushfires ... Sunrise Farm ... stonefruit ... macadamias ... budding ... binding your EG collection ... tree planting.

EG20: Apples ... pears ... cordon & espalier ... avocado ... the Zolins ... pollen ... build a haybale pig house ... love your cow ... rose hips ... the mudbrick flats ... solar homes ... gourds ... preserve fence posts.

EG21: Womancraft — all articles by women ... settling down ... earthly arts (interview with Abbie Heathcote) ... axewomanship ... glove puppets ... joy of spinning ... time to weave ... easy rugs ... lambing ... Sumatran house ... mudbrick weekends ... the group ... old roses ... Index (EG10-20).

EG22-3: Australian Access 150 page sourcebook — Aborigines ... organic food growing ... permaculture ... Bill Mollison ... earth building ... wind ... solar ... water power ... solar cells ... water supply ... bucket pump ... with access to groups, books, tools & techniques ... small scale technology.

EG24: Place — 24 groups and 'new settlers' share their place outside the cities ... including Mare Carter ... Ron Edwards ... Neil Douglas ... Gundaroo Store ... Rainbow Region ... Universal Brotherhood ... Mt Oak ... Moora Moora ... bush ashram ... desert oasis, cold winters ... personal stories from 20th century pioneers.

EG25: Australian Access 2 — 130 page sourcebook — livestock ... aquaculture ... fencing ... wombat gates ... killing ... tanning ... food and nutrition ... Dorothy Hall ... a year's supply of food ... grain grinders ... mincers ... methane basics ... wind generator ... low energy solar homes ... greenhouse ... more tools & techniques.

EG26: Colour spread on the earth-built kasbahs of Morocco ... owner-builders report on homes of stone, timber and mudbricks ... build a slab cottage ... tree felling ... two solar-electric homes ... Earth Garden survey ... survival vineyard ... acorns ... fruit without poisons ... compost dunny ... home-made gas ... quandong ... pumpkin recipes.

EG27: Plants we eat! — 100 tropical food plants for Australia (part 1) ... plant protein ... 16 legumes to grow & eat ... like winged bean ... pigeon pea ... lablab bean ... cowpea ... sword bean ... chickpea ... sugar pea ... mung bean ... soybean ... adzuki bean ... life-raft ... blacksmithing ... bluestone building ... mudbrick solar home ... wok cookery ... choko ... homebirth.

EG28: Animal stories — by packhorse through the Victorian Alps ... horse & buggy ... Mary's black sheep ... the woolly Merino ... Timbertown bullocky ... tropical food plants for Australia (part 2) ... stringybark baskets ... tamarillo ... buying bees ... solar trike & fan ... make a poker ... persimmon ... seed patents.

EG29: Mudbrick building primer — the monastery at Stroud ... six builders & their mudbrick experiences ... mud barbecue ... Bob's bonza brickmaker ... earth floors ... curved walls ... herbs on the roof (sod it!) ... low energy design ... the cutting axe ... food plants for tropical Australia (part 3) ... coconut mats ... mango mania.

EG30: Organic growing guide — the organic idea ... food without poisons ... making compost in heaps, pits, trenches, boxes, bins & barrels ... carpet the garden ... wot no digging? (mulch it instead!) ... organic methods for the semi-arid West ... compact growing boxes ... a traditional farmer ... preserving figs ... tasty tempeh ... the Bornhoffen story ... pasta ... glass bottle mosaics ... two trickle watering systems ... cool kitchens ... macrobiotic bakery.

EG31: Energy: alternative at work — make your own hydraulic ram ... second-hand windpump ... yacht wind-generator ... mudbrick sequels ... freezing food ... blanching ... choosing a freezer ... zucchini glut ... drying fruit ... all about sprouts ... fireless cookers (hot boxes and baskets) ... camp oven ... growing greens in the wet ... building a log house (part 1) ... index (EG21-EG30).